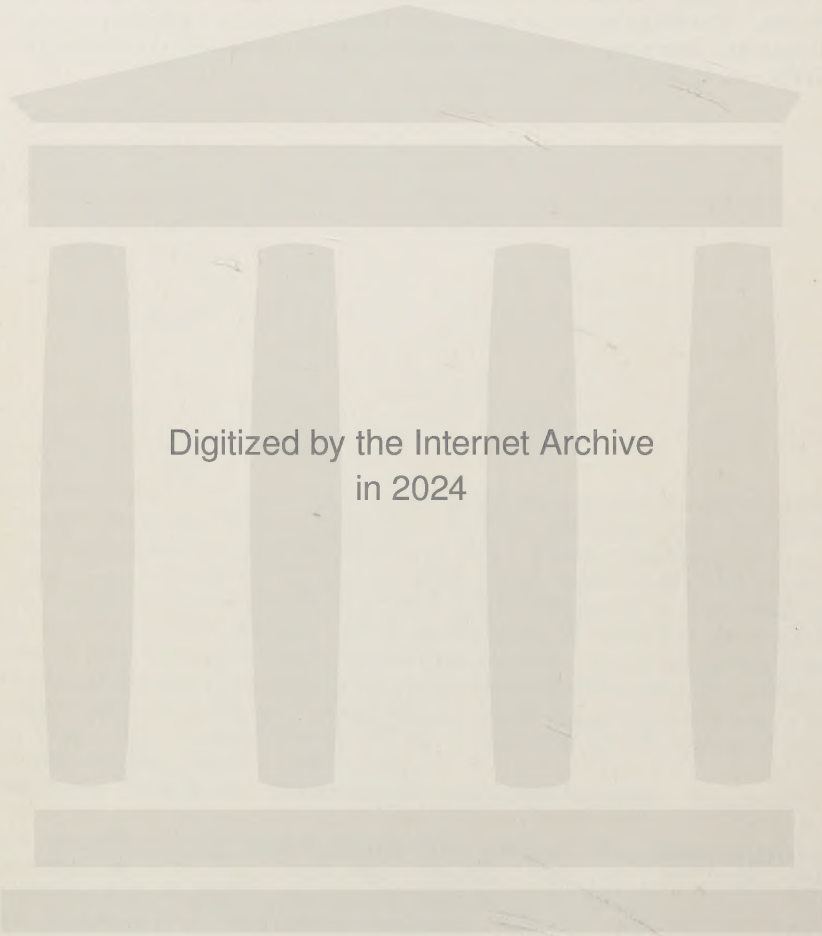


1323. MUND, W. Sur une technique d'exposition d'un liquide quelconque à l'action des rayons  $\alpha$ . [A method of exposing any kind of liquid to the action of  $\alpha$  rays.] Compt. Rend. Soc. Biol. 91: 1448-1449. 1 fig. 1924.

1324. ROSE, D. H., AND NEIL E. STEVENS. The excessive politeness of American botanists. Science 61: 656-657. 1925.

1325. TEDDER, GEO. E. Report of the Everglades Experiment Station. Florida Agric. Exp. Sta. Ann. Rept. 1924: 130R-136R. 1924.—Primary reports are given of the new experiment station in the Everglades, southern Florida.—*J. C. Th. Uphof*.

1326. TOBLER, F. Rindenstoff für Bucheinbände. [Barks for book covers.] Tropenpflanzer 26: 61-63. 1923.—In the tropics books with linen and leather covers are attacked by fungi and insects. The writer mentions a number of tannin-producing barks of species belonging to the Ulmaceae, Moraceae, Leguminosae, and Malvaceae which might prove satisfactory for book covers.—*J. C. Th. Uphof*.



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Published for the Owners,

THE BOARD OF CONTROL OF BOTANICAL ABSTRACTS, INC.,

by

THE WILLIAMS & WILKINS COMPANY

MT. ROYAL AND GUILFORD AVENUES

BALTIMORE, U. S. A.

Entered as second-class matter, November 9, 1918, at the post-office at Baltimore, Maryland, under the Act of  
March 3, 1879

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FOR EDITORIAL AND BUSINESS NOTICES, SEE THIRD COVER PAGE



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A monthly serial furnishing abstracts and citations of publications in the international field of botany in its broadest sense.

UNDER THE DIRECTION OF

THE BOARD OF CONTROL OF BOTANICAL ABSTRACTS, INC.

J. R. SCHRAMM, Editor-in-Chief

FREDERICK V. RAND, Associate Editor-in-Chief

University of Pennsylvania, Philadelphia, Pa.

Vol. 15

FEBRUARY, 1926

No. 2

ENTRIES 1327-2154

## AGRONOMY (CROPS AND SOILS)

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MARY R. BURR, *Associate Editor* (Crops)

T. D. RICE, *Associate Editor* (Soils)

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## CROP SCIENCE (ARVICULTURE)

1327. ANONYMOUS. *Africa and sugar.* Internat. Sugar Jour. 27: 403-404. 1925.—In the western migration of sugar cane from its home in India and the East it was carried by the Moors along the northern coast of Africa, but no great development took place there. A certain amount is still grown in the Nile valley and at the opposite extreme in Natal a promising sugar industry has grown up during the last quarter of a century, but after years of experiment these countries, being outside the tropics, must be content with 2nd-class, thin, and hardy canes of the Indian alliance. The warmer and moister portions of the continent are permeated by thick, tropical varieties, but in no place except latterly in Mozambique are these grown in mass cultivation for sugar production. Schweunfurt in his exploration of the Bahr-el-Ghazal basin found thick sweet cane in a semi-wild condition on entering the tropical zone bordering the Congo basin, and in the South, Livingston when traveling into the upper Zambesi region found cane in a similar condition soon after entering the palm belt.—The author suggests the development of small local concerns for production of crude raw material as the most promising means of establishing a sugar industry in Africa.—*Nellie E. Fealy.*

1328. ANONYMOUS. *Power alcohol from beet in the United Kingdom.* Internat. Sugar Jour. 27: 237-238. 1925.—The British Power Alcohol Association has issued an appeal for development of power alcohol production from sugar beets in the United Kingdom. Government subsidy of beet growing for power alcohol is believed desirable. Such an industry would not compete with the beet-sugar industry, as distilleries for this purpose with a capacity of 200 to 250 tons daily would be feasible, while sugar factories require a minimum of 1,000 to 1,200 tons. Government encouragement of the power-alcohol industry would be an effective factor in furthering the steps underway to bring back to cultivation at least 1,000,000 of the 5,000,000 acres which have gone back to grass. The power alcohol would be used for mixing,



after treatment, with petrol in any quantities up to 50%, such mixture increasing efficiency, cleanliness of the engine, smoother pulling power, elimination of "knock," etc. Necessity of independent national transport and uncertainty of sufficient petrol in the future are urged as reasons for establishing the power-alcohol industry.—*Nellie E. Fealy*.

1329. ANONYMOUS. The value of fallowing for wheat. Some further data about the 1924-1925 season. *Agric. Gaz. New South Wales* 36: 545-547. 1925.—The data show the distribution of approximately  $3\frac{1}{2}$  millions of acres of wheat grown in New South Wales on new, fallow, and stubble land. Yields are given as 14.8, 19.7 and 14.8 for the 3 treatments, respectively.—*L. R. Waldron*.

1330. ANONYMOUS. Wheat supply and demand. *Nature* 116: 187. 1925.—Reference is made to 3 papers published at Stanford University, California.—*O. A. Stevens*.

1331. ANONYMOUS. Die Bedeutung des Wurzelvermögens der Kartoffelsorten. [Significance of the root growth of potato varieties.] [Rev. of: GROSS, EMMANUEL. *Zur Kartoffelernte 1921 und einiges über Altern und Abbau der Kartoffeln*. Mitteil. Deutsch. Landw. Ges. Brünn 1922<sup>1</sup>: 2-9. 1922.] Oesterreich. Zeitschr. Kartoffelbau 2: 16. 1922.—During the dry summer of 1921 the variety Sachsische Zwiebel showed marked drought resistance correlated with its deep root system, and the importance of selecting deep-rooted sorts in breeding potatoes for warm dry climates is pointed out.—*F. Weiss*.

1332. ANONYMOUS. Oats. [Rev. of: HUNTER, HERBERT. *Oats: their varieties and characteristics, a practical handbook for farmers, seedsmen, and students*. 131 p. Ernest Benn: London, 1924 (see Bot. Absts. 14, Entry 3172).] *Nature* 116: 128-129. 1925.

1333. AEREBOE, FRIEDRICH. Die Bewirtschaftung von Landgütern und Grundstücken. I. Teil. Allgemeine landwirtschaftliche Betriebslehre. [The management of farm estates and pieces of property. Part I. General farm management considerations.] 6th ed. 697 p. Paul Parry: Berlin, 1923.—A text-book of farm management discussing the following phases of the subject: The rôle and importance of the various phases of farming; farm organization; influence of prices on the various phases of farming; bearing of climate and soil on farming; the education, training, personality, and status of the farm manager; and farming limitations and profits.—*W. B. Lydenberg*.

1334. APPLEMAN, C. O. Apical dominance in potatoes as an index of seed value. *Potato News Bull.* 2: 357-358. 1925.—This is a condensed statement of Maryland Agric. Exp. Sta. Bull. 265, in which the degree of apical dominance of sprouts is shown to be a practical index of seed vitality. The use of a sprout test as the final step in certification, or at least in selection for a seed plot, is recommended. The index value of apical dominance depends on normal development of the terminal sprouts, and is expressed in only the first crop of sprouts.—*F. Weiss*.

1335. B., A. B. Crop production in India. [Rev. of: HOWARD, A. *Crop production in India: a critical survey of its problems*. 200 p. Oxford University Press: London, 1924 (see Bot. Absts. 14, Entry 5006).] *Nature* 116: 4-5. 1924.—"The work of Howard may be taken as a model of what is required of research workers in the applied sciences."—*O. A. Stevens*.

1336. BARRE, H. W. Boll weevil investigation in 1923. *South Carolina Agric. Exp. Sta. Circ.* 31. 1-29. *Frontispiece*. 3 fig. 1924.—In the experiments reported, close spacing of cotton plants leads to earlier fruiting. In seed treatment tests with untreated seed, seed delinted with strong  $H_2SO_4$ , seed rolled in  $NaNO_3$ , seed delinted with gaseous HCl, and seed delinted at the oil mill, the seed delinted with  $H_2SO_4$  gave the earliest and largest yield. Earliness of fruiting in general is furthered by that fertilizer which best promotes the growth of the plants; 5-6% of nitrogen and 8% of phosphoric acid were best during the season reported. Large applications of potash have delayed maturity. Pulling of the 1st squares (blossom buds) stimulated square formation but caused a net loss in the bolls produced; it did not seem to influence the rate at which squares and bolls develop. There is a variation among varieties in the date at which squaring starts, the rate at which it proceeds, and the number of bolls which persist on the plant and ripen. Squares formed early in the season and the bolls resulting from them develop more rapidly than those set late in the season. Bolls of Webber and Cleveland, tagged the day they bloomed and measured weekly, were found to reach full size in 18 days.—*C. A. Ludwig*.



1337. BARRE, H. W. Thirty-fourth annual report of the South Carolina Agric. Exp. Sta. 55 p. 19 fig. 1921.—The following topics pertaining to plants are discussed: Experiments with crops, fertilizers, plant diseases, bacterial content of milk, fruits and vegetables, etc.—Barrenness in corn has been found to be hereditary and can be bred out of a strain by detasseling the barren stalks before they blossom.—“When the initial bacterial content of the milk is low there is no marked increase in the number of bacteria in the first 4 hours.” The bacterial content of freshly drawn milk was found to vary with individual cows.—*C. A. Ludwig.*

1338. BARRE, H. W. Thirty-fifth annual report of the South Carolina Agric. Exp. Sta. 72 p. 23 fig. 1922.—This report includes experiments with crops, fertilizers, plant diseases, bacterial content of milk, fruits and vegetables, and covers various topics concerning field and horticultural crops at the Coast and Pee Dee Substations.—*C. A. Ludwig.*

1339. BARRE, H. W. Thirty-sixth annual report of the South Carolina Agric. Exp. Sta. 74 p. 22 fig. 1923.—This report includes discussions of growth and fruiting studies of cotton, experiments with crops, fertilizers, plant diseases, fruits and vegetables, and various items concerning plants at the Coast and Pee Dee Branch Substations.—In forestry experiments at the Coast Station on land annually burned over no reproduction at all has been secured, except sparsely with unsatisfactory individuals of long leaf pine.—*C. A. Ludwig.*

1340. BARRE, H. W. Thirty-seventh annual report of the South Carolina Agric. Exp. Sta. 95 p. 30 fig. 1924.—This includes discussions of spacing tests, seed treatment, time of thinning, fertilizers, fruiting studies, stripping of squares (blossom buds), topping, time of planting, development of squares and bolls, and shedding of cotton; variety tests with cotton, corn, wheat, barley, rye, oats and soybeans; soybeans and cowpeas for hay; oil content of cotton seed; fertilizer studies on cotton, corn, oats, and peanuts; plant diseases; fertilizer tests on peaches, asparagus, tomatoes, and Irish potatoes; Irish potatoes for seed; variety tests of tomatoes, apples, and bunch grapes; forestry; and a few other topics.—*C. A. Ludwig.*

1341. BARTLETT, H. Variety and manurial trials with maize. Agric. Gaz. New South Wales 36: 548. 1925.—Hot weather at time of pollination materially reduced yields. Superphosphate, 35 pounds per acre, showed an increase of 4 bushels over no fertilizer.—*L. R. Waldron.*

1342. [BARULINA, E. I.] Барулина, Е. И. Опыт систематического изучения расового состава в пределах одой разновидности пшеницы (*Triticum vulgare* var. *ferrugineum* Al.). [A systematic botanical study of the characters—Jordanons—within the limits of one group of the soft wheat, *Triticum vulgare* var. *ferrugineum* Al.] (English summary.) Труды по Прикл. Бот. и Селекции [Bull. Appl. Bot. and Plantbreed.] 13: 259-367. 4 pl. 6 fig. 1922-1923. [1923].—As a material for this study, 197 samples of spring and winter types of *T. vulgare* var. *ferrugineum* Al. were used, the majority of them having originated in Asia. Different characters found in this variety of wheat are analysed and listed. A key is made according to which different types found in the variety are classified. Greatest polymorphism was observed in wheats from Central Asia.—*M. Demerec.*

1343. BESLEY, H. J., E. G. BOERNER, AND J. H. COX. United States grades for rye, recommended by the United States Department of Agriculture. U. S. Dept. Agric. Dept. Circ. 246. 3-6. 1922.

1344. BESLEY, H. J., E. G. BOERNER, AND W. D. SMITH. United States grades for rough rice. U. S. Dept. Agric. Dept. Circ. 290. 1-10. 1923.

1345. BESLEY, H. J., E. G. BOERNER, AND W. D. SMITH. United States grades for milled rice. U. S. Dept. Agric. Dept. Circ. 291. 1-17. 1923.

1346. BLACKWELL, C. P. Fertilizer experiments with cotton at Clemson College. South Carolina Agric. Exp. Sta. Bull. 211. 1-21. 1 fig. 1922.—This is a report of a long-time fertilizer experiment on cotton at Clemson College, South Carolina, on soil classified by the United States Bureau of Soils as Cecil sandy loam. It is typical of much of the soil of the Piedmont section of South Carolina. The results show that phosphoric acid is the first limiting factor on this particular soil and that nitrogen is the next. Potash gave only a small increase. Lime gave a slight decrease when used with acid phosphate alone and a slight increase when used with a complete fertilizer. Acid phosphate and blood combined, gave the best results of combinations of 2 elements. Eight tons of stable manure and 300 pounds of



acid phosphate gave the best results secured by any treatment. It is difficult to maintain the cotton yield on this soil by the use of commercial fertilizer alone. There is a residual effect, lasting for several years, from the application of large amounts of ammonia or phosphoric acid.—*C. A. Ludwig.*

1347. BLACKWELL, C. P., AND T. S. BUIE. **Cotton production. Factors affecting earliness and yield.** South Carolina Agric. Exp. Sta. Bull. 219. 1-48. 8 fig. 1924.—This is a detailed report, with numerous tables and charts, of a large number of experiments with cotton carried out in South Carolina, U. S. A. Fertilizer tests carried out on 7 leading soil types gave the following indications: A properly balanced fertilizer gave the earliest and largest yield, 600 to 800 pounds per acre being the most profitable rate. Nitrogen proved to be the first limiting factor in yield and was important in the production of an early crop. Phosphorus was the next limiting factor and had a marked influence on the yield and earliness of the crops. Small applications of potash increased yields but heavy applications tended to delay maturity and decrease yields. In a 1-year test as to time for applying nitrate of soda as a side dressing the best time was found to be 10 days after chopping (thinning). Similarly, each increase in the rate of application of nitrate of soda up to 300 pounds per acre—the maximum applied—increased the yield. As a side dresser, nitrate of soda and sulphate of ammonia gave best results and ammonium nitrate was very satisfactory.—Uncultivated cotton develops faster and matures earlier than that which is cultivated, and continued cultivation until late in the season causes the cotton to continue vegetative growth longer and to fruit later.—During the preceding 4 years the Piedmont strain of the Cleveland variety gave the highest average yield at Clemson College (in the Piedmont section); at Florence (in the coastal plain) Dixie-Triumph was 1st, closely followed by Cleveland-Coker and Cleveland-Wannamaker; at Summerville (in the coastal plain), under heavy boll weevil infestation, Cleveland-Coker was 1st and Cleveland-Wannamaker 2nd. Comparatively close spacing of the plants in the field has given the best results.—Detailed fruiting studies for 1 year indicate that Cleveland does not begin blooming quite as early as a few other varieties, but by midsummer it has set more lint cotton per stalk than any other variety studied and maintains this position throughout the rest of the season; the Sugar Loaf variety has the shortest boll period, 53.24 days, followed closely by Cleveland; bolls from early blooms develop more quickly than bolls from late blooms; stripping squares (blossom buds) from plants in different stages of growth stimulates blooming, but fewer of these late blooms ripen bolls; rates of blooming and final yields are in almost direct proportion on fertilizer plots.—*C. A. Ludwig.*

1348. BRUCE, OSCAR C. **The relation of sulphur to alfalfa production.** Jour. Agric. Res. 30: 937-947. 3 pl. 1925.—The purpose of this paper is to investigate the effect of sulphur on the growth of alfalfa. A review of literature is given, stating the effects of sulphur on alfalfa and other related crops. The work reported consists of 10 results of a single experiment for one season. Elemental sulphur was applied in several combinations with other fertilizer treatments, at the rate of 384 pounds per acre. Inoculated sulphur alone, at the same rate of application, is also compared with uninoculated sulphur alone. The soil used was the Oswego silt loam, a black, productive residual soil derived from weathered shale. Two cuttings of the crop were allowed to mature in the greenhouse, then prepared for analysis. In general it was found that this type of soil contained a little more sulphur than the average Kansas soil and that the sulphur gave no marked increase in yield or root development of alfalfa. The nitrogen content of tops and the sulphur content of roots and tops were not increased by the sulphur treatment. Neither was there any increase in nodule development on the roots as a result of sulphur applied. Under the conditions of this experiment, sulphur increased the acidity of soil when not supplemented with lime. Practically the same growth response was observed with the inoculated sulphur treatment as with the uninoculated sulphur.—*Author.*

1349. BUSHNELL, JOHN. **Ventilation in potato storage.** Potato News Bull. 2: 358-361 1 fig. 1925.—The effect of ventilatoin is discussed as regards its effect on humidity, gaseous exchange, and temperature. The effect of ventilation may be different, depending on the stage of dormancy of the tuber. During the early part of the storage period, if the temperature is low, ventilation is unnecessary and may be detrimental because it promotes shrinkage. The suggestion is advanced that ventilation hastens sprouting, and that temperature may be the factor that determines sprouting in unventilated bulk storage.—*F. Weiss.*



1350. CHIRÎTESCU-ARVA, M. *Acțiunea apei în cantitate optimă în diferite epoci de vegetație asupra plantei.* [The action of water in optimum quantity on the different vegetative periods of the plant.] (Rumanian with French summary.) *Bul. Inform. Grădinii Bot. Muz. Bot. Univ. Cluj* 3: 65-80. 1923.—The author gives the results of vegetative experiments conducted at the Agricultural Academy of Cluj, 1922, with a variety of wheat known in Rumania as "Turcesc alb" compared with winter wheat of Banat, to establish the action of water upon the plants at various periods of growth.—*Author (translated by Grace M. Weston).*

1351. CLAYTON, E. S. *Tumut maize-growing contest.* *Agric. Gaz. New South Wales* 36: 544. 1925.—Fourteen men competed, using different varieties; seed was furnished by the competitors. The plants were grown upon 1 farm. Cool weather prevented high yields.—*L. R. Waldron.*

1352. D., W. D. *The potato crop.* *Jour. Dept. Lands and Agric. [Ireland]* 25: 54-61. 1925.—Varieties were compared as to yield and immunity to black scab disease, the comparison including some seedling and imported commercial varieties. Source of seed influenced the amount of foliage diseases, the vigor, and the yield. Growth on bog land apparently reduces the leaf curl (leafroll) percentage. Wider drills give decreased yields. Wider spacing of sets did not affect the net yield, but decreased the proportion of yield of seed size.—*Donald Folsom.*

1353. DAVIDSON, R. J. *Trials with sulphur as a top-dressing at Yanco.* *Agric. Gaz. New South Wales* 36: 548. 1925.—Sulphur applied to alfalfa did not give a net increased income of crop above cost of fertilizer and application.—*L. R. Waldron.*

1354. DOUIN, R. [Rev. of: SCHILLING, E. *Die Faserstoffe des Pflanzenreichs.* [Plant fibers.] vii + 320 p. S. Hirzel: Leipzig, 1924 (see Bot. Absts. 15, Entry 141).] *Rev. Gén. Bot.* 36: 512. 1924.

1355. DUYSEN, FRANZ. *Unkräuter.* [Weeds.] (Revised by EDWARD EGGLHUBER.) *Bücherei für Landwirte.* 114 p. 59 fig. Walter de Gruyter & Co.: Berlin, 1925.—This 2nd volume of the series on general agricultural subjects, is a condensed treatment of the common weeds of Germany. About 130 species are treated under names, description, methods of reproduction, occurrence and control methods.—*W. C. Muenscher.*

1356. FENG, RUI. *A program of Chinese agriculture.* 373 p. Ph.D. Thesis. Cornell University: Ithaca, New York, 1924.—The author discusses the following important phases of his subject: Land systems, crop systems and farm work planning, methods of maintenance of soil fertility, agricultural sciences, agricultural trade and commerce, agricultural education, and agricultural administration. A list of references and a bibliography are included.—*Mary R. Burr.*

1357. FIEHE, J. *Über Sojabohnen und Sojabohnenbrot.* [Soybeans and soybean bread.] *Zeitsch. Untersuch. Nahrungs- u. Genussmittell.* 49<sup>1-2</sup>: 45-51. 1925.—The various food products made from the soybean and extensively used in oriental countries are briefly discussed. The utilization and value of soybeans, soybean oil and soybean oil meal, especially for food in various European countries during the World War, are taken up. Considerable data are given on the value of soybean oil meal in bread making, and analyses of breads made with varying proportions of soybean oil meal and wheat and rye flours are included.—*W. J. Morse.*

1358. GARNER, W. W., W. M. LUNN, AND D. E. BROWN. *Effects of crops on the yields of succeeding crops in the rotation, with special reference to tobacco.* *Jour. Agric. Res.* 30: 1095-1132. *Pl.* 1-7, *fig.* 1-17. 1925.—Previous work, together with past and current theories, concerning the effects of crops and cropping systems on the productiveness of the soil are briefly reviewed. Results are given of rather extensive field tests conducted in Southern Maryland on Collington fine sandy loam soil for the purpose of ascertaining whether legumes or other soil-improving crops, combined with commercial fertilizers, can be used successfully in intensive tobacco culture; and to study the comparative effects of tobacco and certain other crops on those which follow in the rotation. Different fertilizer treatments were included in the cropping tests. On a comparative basis tobacco does not seem to be especially injurious to general soil productiveness. The tobacco crop itself, however, is quite sensitive to the effects of preceding crops. Growth may be seriously retarded as a result of preceding crops of tobacco or of various other crops, including legumes and such cover crops as rye and grasses. These crop effects are correlated with seasonal conditions, maximum adverse effects occurring



in seasons of heavy rainfall. None of the cropping systems tried have given as good results with tobacco as allowing the soil to remain idle for one or more years between crops. The tobacco crop in its effects on yields of succeeding crops of tobacco, potatoes, corn, wheat, oats and rye stands, on the whole, between the potato crop and the corn crop but in many particulars more nearly resembles the former than the latter. Corn seems not to be very sensitive to the effects of preceding crops. Use of legumes in the cropping system has tended to increase rather than overcome the differences in effects of tobacco, potatoes and corn on succeeding crops of small grains. Tobacco and potatoes were unable to effectively utilize the nitrogen of the legumes, but corn and the small grains were greatly benefited thereby. The crop effects are markedly influenced by character of soil and weather conditions and to some extent by fertilizers and lime. These effects are not wholly explainable on the basis of the plant-food theory of soil productiveness or of parasitic disease.—*W. W. Garner.*

1359. GREEN, L. J. Field experiments with rice. Coonamble experiment farm, 1924-25. *Agric. Gaz. New South Wales* 36: 581-587. 2 fig. 1925.—Rice was grown according to the California method. The crop was sown at the rate of 110 pounds per acre. Crop matured in 154 to 172 days according to the variety. Yields ranged from 57 to 92 bushels per acre. Attempts to grow ratoon rice were not successful.—*L. R. Waldron.*

1360. HANLEY, J. A. Improvement of grassland in Yorkshire. *Jour. Ministry Agric. Great Britain* 31: 133-138, 251-259. 1924.—A report is given of results secured from the use of lime, phosphates, and potash for improvement of grassland on different types of soil.—*M. B. McKay.*

1361. HUNNICUTT, BENJAMIN H. The agricultural resources of Brazil, based on the census of 1920. 39 p. Maps. Escola agricola de Lavras: Lavras, Brazil, 1924.—(Reprint from "Brazilian Business.")

1362. KORSMO, E. Ugress i untidens jordbruk. [Weeds under present conditions of farming.] 694 p. 400 fig. J. W. Cappelen: Oslo, 1925.—In his work, based upon 30 years of investigation, the author not only describes in detail 165 weeds of Scandinavia but also presents data on the distribution of their seed in various agricultural products. Considerable emphasis is placed upon the habits and life history of weeds. Data are also presented showing the number of seed produced by weeds, the time of their germination, the chemical composition of seed and whole plants. Weeds are classified according to habits and methods of reproduction. Several special chapters are devoted to the losses caused by weeds and methods for controlling and eradicating weeds. The author presents numerous charts and tables showing the results of various control methods as performed by him under actual field conditions. In addition to the scientific name the author gives the common names of the weeds in the Scandinavian, German, French and English languages. The greater part of the illustrations are original; those of the plants are reproductions of the author's large plates prepared for agricultural schools. The distinguishing characteristics of seed are brought out clearly in large-scale illustrations. An extensive bibliography concludes the book.—*A. Astander.*

1363. [KUPRIANOV, I. M.] Куприянов, И. М. О культуре многолетней ржи (*Secale montanum* Guss.) на Сочинской Садовой и С.-Хоз. Опытн. Станции. [Cultivation of perennial rye (*Secale montanum* Guss.) at the Agricultural Experiment Station in Sothsi (Caucasus).] (English summary.) Труды по Прикл. Бот. и Селекции. [Bull. Appl. Bot. and Plantbreed.] 13: 509-513. 1922-1923. [1923].—Perennial rye was planted by the author in the spring and it was found that during the 1st year, plants developed very slowly. The 1st crop was obtained the 2nd year, single plants having as many as 60 ears. The yield of the 3rd year on poor soil was 40 puds (655.20 kg.) on 1 dessjatine (10,924 m<sup>2</sup>). The weight of 1000 grains was 16.4 gr. In the 4th year the yield decreased and in the fall the perennial roots perished. The author considers that wild rye might be of importance as a forage crop.—*M. Demerec.*

1364. LAFFERTY, H. A. The interpretation of seed testing results. *Jour. Dept. Lands and Agric. [Ireland]* 25: 33-39. 1925.—The "Iris" method discloses an excess of light seed by a reduction in the germination percentage, while the "Continental" method discloses it by a reduction in the percentage of purity.—*Donald Folsom.*



1365. LOVE, H. H., AND W. T. CRAIG. Results of experiments with oats in New York. New York Agric. Exp. Sta. [Cornell] Bull. 436. 3-24. Fig. 1-7. 1925.—The spreading panicle type of oats has been found superior to the side type; the latter does not fill nor tiller well. The early oats gave lower yields than medium-season or later oats. High weight of a bushel of oats is not always an indication of a good variety, for some high-yielders do not show this characteristic. Selected strains, when compared to the commercial varieties, showed gains made through selection. Cornelian was found to be the outstanding variety, which in addition to being a high yielder also has a high percentage of meat.—*W. O. Gloyer.*

1366. McCauley, C. Grain sorghum variety trials. Northwestern district. Agric. Gaz. New South Wales 36: 551-552. 1925.—Notes are given on the production of 5 varieties grown upon 5 farms. The maximum yield of 44 bushels was secured from Peterita.—*L. R. Waldron.*

1367. McCauley, C. Inverell maize-growing contest, 1924-25. Agric. Gaz. New South Wales 36: 623-624. 1925.—In a variety trial of 21 varieties upon 2 private farms, Funk's 90-day gave the highest average yield, producing 48 bushels per acre.—*L. R. Waldron.*

1368. MAHALANOBIS, P. C. The probable error in field experiments in agriculture. Agric. Jour. India 20: 96-116. 3 fig. 1925.—The author considers an article by B. N. Sarkar (Agric. Jour. of India 18<sup>o</sup>), which presents a discussion from the statistical standpoint. Attention is first called to the factors which affect the yield of crops from a statistical point of view. It is suggested that the probable error of a difference should, wherever possible, be calculated by the direct difference method and the odds obtained by the use of "students'" method. Consideration is given to the estimating of systematic variations in external factors and a somewhat different procedure than that followed by Sarkar is suggested. It is deemed advisable in finding the probable error from small samples to "correct" the observed standard deviations by multiplying them by suitable correcting factors. Three appendices dealing with methods are given.—*T. K. Wolf.*

1369. MAKIN, R. N. Pasture improvement on the south coast and southern tableland. Agric. Gaz. New South Wales 36: 588-590. 1925.—In pasture improvements, attention should be paid to suitability of the plants, fertilizers, and weed control. It is not generally necessary to plow and harrow pasture land before seeding.—*L. R. Waldron.*

1370. MANGELS, C. E. Protein content of North Dakota wheat. North Dakota Agric. Exp. Sta. Bull. 191. 1-41. 8 fig. 1925.—A brief introduction deals with the relation of protein content of wheat to flour quality, points out the difference between "protein" and "gluten," and discusses briefly the relation of protein in wheat to protein in flour. Data presented show that there is no correlation between test weight per bushel and protein content. As regards percentage of dark, hard, vitreous kernels, the data for the 1922 and 1923 crops show a positive correlation with protein content which is significant both biologically and statistically but the 1924 crop shows an insignificant positive correlation. June and July temperature is probably the most important factor in determining protein content of North Dakota wheat crops. Rainfall is apparently not so important a factor as temperature, although an inverse relation is indicated. Wheat following red clover or sweet clover is higher in protein content than that following a non-leguminous crop. Peas and oats did not show a consistent effect upon the protein content of the succeeding wheat crop. There appears to be no consistent relationship between rust and protein content. Cutting wheat before maturity appears to have the effect of increasing percentage of protein, but such increase is at the expense of yield. As to varietal differences in protein content, the variety Kota usually exceeds Marquis and other bread wheat varieties in many sections of the state.—*P. J. Olson.*

1371. MORGAN, GEORGE W. Experiments with fallow in North-Central Montana. U. S. Dept. Agric. Dept. Bull. 1310. 1-15. Fig. 1-6. 1925.—This bulletin reports the results of crops grown on fallow as compared with other tillage methods, 1917-1923, during which period the rainfall was less than the average for 44 years. Yields of wheat, barley, oats and corn after fallow materially excelled those secured in continuous culture. The effect of time and depth of plowing on the yields of wheat are discussed, and it is shown that stable manure applied before plowing for fallow did not increase yields, while green manures reduced yields as compared with fallow by about 50%.—*Author.*

1372. MUSSER, A. M., AND C. A. LUDWIG. **Certified seed in Irish potato production.** South Carolina Agric. Exp. Sta. Bull. 218. 1-16. 1923.—This gives a brief statement of what certified seed potatoes are and records the results of 2 years' tests in which potatoes were grown from such seed from several sources in comparison with uncertified seed purchased locally. The certified seed gave an increased yield over that from the uncertified in all the tests. Attention is called to the low percentage of disease on the certified seed, and much of the bad germination secured from the ordinary seed is credited to disease borne on the tubers. No system of inspections and certification, however, can do away with all disease, and growers are cautioned against allowing certification to take the place of a sterilization treatment of the seed tubers.—*C. A. Ludwig.*

1373. NICHOLSON, G. **Time of ploughing for late-sown maize.** Agric. Gaz. New South Wales 36: 622. 1925.—For an average of 5 seasons, early winter plowing for corn has shown an increased yield of 12 bushels per acre in contrast with spring plowing.—*L. R. Waldron.*

1374. PALMER, ARTHUR W. **The commercial classification of American cotton.** U. S. Dept. Agric. Dept. Circ. 278. 1-35. 19 fig. 1924.

1375. PARR, P. H. **Cane sugar crop seasons and production.** Internat. Sugar Jour. 27: 370-372. 1925.—Comparative data are given for some of the most important cane-sugar-producing countries of the world. A diagram gives a simple and comprehensive visualization of the percentage production of cane sugar for each month of the year, and a table gives the tonnage and percentage production of 38 countries, of insular possessions, and of Louisiana and Texas.—*Nellie E. Fealy.*

1376. PASSERINI, N. **Esperienze sulla moltiplicazione della patata comune per mezzo dei germogli e dei tuberi privati dei medesimi. Nota preventiva.** [Experiments on the multiplication of the common potato by means of sprouts and of tubers deprived of sprouts.] Boll. Soc. Bot. Italiana 1925: 60-61. 1925.—Bretignière and Verchère (Ann. École Nation. Agric. Grignon 7: 11. 1920-1921) have obtained satisfactory results for the variety Flucke with the multiplication of potatoes by means of sprouts, notwithstanding the failure which amounted to about  $\frac{1}{3}$ . In comparison with the ordinary multiplication by means of tubers they have obtained a numerical diminution but an increase in the average weight of the tubers harvested. Our experiments were carried out in 1924, in compact soil and with the common variety Toscana. Tubers from which sprouts developing in storage had been removed, were planted separately. With the multiplication by means of sprouts the failure amounted to about  $\frac{1}{2}$ , but the remaining plants grew fairly well as far as height of stems and leaf production were concerned but were inferior in tuber production. During the extreme dryness the growth of the tubers was very poor in the plants obtained both from normal tubers and from those deprived of sprouts. The multiplication by means of sprouts considerably decreased the number and the total weight of tubers produced from each plant. Greater distancing of the plants did not have a more favorable influence on the product. The plants from tubers deprived of sprouts, especially those distanced at 50 cm., unexpectedly produced double the amount of tubers as compared with plants derived from normal tubers.—*Author (translated).*

1377. PASSERINI, N. **Sopra la influenza della divisione della radice di Brassica Rapa L. sulla produzione del seme.** [Influence of the division of roots on the seed production in Brassica Rapa L.] Boll. Soc. Bot. Italiana 1925: 6-10. 1925.—The division of roots along with grafting and the multiplication through buds has been adopted for an increase in the seed production of selected varieties of sugarbeets. On February 25, 1924, roots, approximately equal in volume, produced from seed planted in the summer of 1923, were pulled and planted in plots previously prepared in the grounds of the Institute of Agronomy, as follows: (1) 8 entire roots from which 8 plants were obtained; (2) 8 roots, divided longitudinally in halves, from which 16 plants developed, of which 1 died during growth; (3) 8 roots divided longitudinally in quarters. Of the 32 plants obtained only 25 reached maturity. From the time of flowering a more uniform and abundant growth was noticed in the inflorescences of the turnips with entire roots.—They were harvested May 14, 1924. From these experiments the following conclusions were drawn: (1) Mutilation of the roots caused the loss of a certain number of individuals, the loss being greater (more than  $\frac{1}{5}$ ) with the division of the roots in quarters. (2) The total weight of seed produced in each of the 3 lots was about the same. However, the



division in quarters would have presumably led to an increase if the serious mutilation had not caused the death of about  $\frac{1}{2}$  of the plants. (3) The mutilation notably reduced the average unit production of seed, and this considerably more with the division in quarters than with that in halves. (4) However, even with mutilation of the roots, in some cases the production of seed surpassed the average for the plants grown from normal roots—in 2 cases on 15 plants (about 13%) with division into halves, and in one case on 25 plants (4%) with division into quarters. (5) The mutilation caused a reduction in the average weight of 100 seed, which was more pronounced the greater the mutilation, 11.5% for the roots divided into halves and 18.8% for those divided into quarters.—*Author (translated).*

1378. PEACOCK, W. M. **Protecting certified seed against fraud.** *Potato News Bull.* 2: 318-322. 1925.—A résumé of the growth of the certified seed-potato industry in North America is given. Further progress is believed to depend on better training of inspectors, more frequent field inspections, more thorough bin inspections and grading of stock, education of growers to recognize fraudulent certification tags, and legal protection of authentic certificates.—*F. Weiss.*

1379. [PISAREV, V. E.] Писарев, В. Е. "Перерождение" пшеницы. [Degeneration of wheats.] (French summary) *Турды по Прикл. Бот. и Селекции.* [Bull. Appl. Bot. and Plantbreed.] 13: 59-70. 1922-1923. [1923].—In a region of the Irkutsk Province, wheat was grown from imported seed which was a mixture of several varieties of *Triticum vulgare*. The author took a sample from 1 of the fields and observed for 5 years the change in its composition. In 5 years the amount of var. *lutescens* changed from 72.0 to 7.6% of the total, that of var. *ferrugineum* from 10.9 to 82.4%, of var. *erythrospermum* from 9.3 to 5.7%, of var. *millurum* from 6.1 to 4.3% and of *T. durum* and *T. compactum* from 1.7 to 0.0%.—*M. Demerec.*

1380. REED, H. J., AND E. W. MOORE. **Report on Moses Fell Annex June, 1924.** *Purdue [Indiana] Agric. Exp. Sta. Circ.* 117. 1-20. 15 fig. 1924.—Yield data on fertilizer tests with corn, soybeans, wheat, and hay are included.—*M. W. Gardner.*

1381. REED, H. J., AND E. W. MOORE. **Report of Moses Fell Annex June, 1925.** *Purdue [Indiana] Agric. Exp. Sta. Circ.* 123. 1-24. 19 fig. 1925.—The average yields per acre per rotation are given for fertilizer tests with corn, soybeans, wheat, and hay.—*M. W. Gardner.*

1382. S., F. P. **Industrial research in cotton.** [Rev. of: *Shirley Institute Memoirs.* Vol. 3. vi + 362 + iv p. *British Cotton Indust. Res. Assoc.: Manchester, 1924.*] *Nature* 116: 164-165. 1925.

1383. SALAMAN, REDCLIFFE. (Chairman.) **Varieties of potatoes with their synonyms immune from and susceptible to wart disease.** 31 p. W. Heffer & Sons, Ltd.: Cambridge, England, 1925.—"This pamphlet contains all the results which have been arrived at by the Synonym Committee of N[ational] I[nstitute of] A[gricultural] B[otany] and its predecessor between the years 1915-1924, as well as those which have been ascertained by the Scottish Board of Agriculture. . . . No name has been included of any variety which has not been tested in regard to its susceptibility to Wart Disease. . . . Two lists are included . . . the one of Distinct varieties, in which case the immunity or otherwise is recorded; and the other of Synonyms, in which case reference is made to the Distinct Variety of which the Synonym is but another name." The chairman is said to be mostly responsible for this paper.—*Frederick V. Rand.*

1384. SCHUSTER, G. L. **Improvement of small grains.** *Rept. Maryland Agric. Soc.* 5: 332-335. 1920 [1921]. This paper emphasizes the importance of good seed, which are only obtainable by proper harvesting, storage, and treatment. Community grain improvement is necessary to prevent mixing of seed during threshing.—*A. Lee Schrader.*

1385. SQUIRE, M. J. E., AND W. R. WATKINS. **Farmers' experiment plots. Sweet sorghum trials, 1924-25. Murrumbidgee irrigation areas (Yanco centre).** *Agric. Gaz. New South Wales* 36: 627-632. 1925.—These trials were carried out upon 9 private farms, 11 varieties being used. A maximum yield of over 32 tons per acre of green fodder was secured.—*L. R. Waldron.*

1386. STOA, T. E. **Winter rye in North Dakota.** *North Dakota Agric. Exp. Sta. Bull.* 193. 1-14. 4 fig. 1925.—The highest yielding variety grown at Fargo is *Dakold*. Large seeded varieties, such as *Rosen* and *N. D. R. No. 9*, while yielding well after mild winters, are



not sufficiently hardy for high average yields. The variety, Rosen, grown for a few years in North Dakota, and probably crossed somewhat with other varieties, has yielded distinctly more than the Rosen variety newly brought in from Michigan. At Dickinson, Dakold was slightly exceeded by a selection from that variety. The Dakold variety is a dark, small-seeded, early-maturing variety developed at the North Dakota Station in 1902.—*L. R. Waldron*.

1387. STOUT, A. B. *Ipomoea batatas*. *Addisonia* 9: 35, 36. *Pl. 306 (col.)*. 1924.—The sweet potato was probably a native of tropical America. It was introduced into Europe by Columbus. In tropical countries it is a profusely blooming herbaceous perennial and is widely cultivated as a root crop. As grown in temperate regions it is an annual and seldom blooms except under greenhouse care.—*T. J. Fitzpatrick*.

1388. STUART, WM. *Potato storage requirements*. *Potato News Bull.* 2: 354–357. 1925.—The general principles of potato storage are discussed from the standpoint of good stock, proper construction of storage houses, handling of stock and control of storage conditions.—*F. Weiss*.

1389. TREGENNA, C. J. *Some notes on tobacco growing*. *Agric. Gaz. New South Wales* 36: 578–580. 1925.—The greatest amount of tobacco is grown in the northern portion of New South Wales, commercially valuable "leaf" cannot be grown within 15 miles of the sea. The largest economic 1-man area is 4 acres.—*L. R. Waldron*.

1390. TURPIN, H. W. *Lucerne, with special reference to its economical cultivation on small irrigation holdings*. Part I. *Jour. Dept. Agric. Union of South Africa* 9: 31–43; Part II. 9: 171–183. 1924.—A treatise on the subject of lucerne growing and value, dealing particularly with soil and climatic conditions, varieties, lucerne as stock feed, and economic considerations. The "Chinese" variety may prove to be the best of all South African lucernes. So far, this variety has proved a wonderful grower in winter so that it is possible to get 1–2 cuttings more per season than from any other kind. Irrigation schemes will probably bring about 100,000 acres under lucerne cultivation, though there are still thousands of acres of suitable land waiting to have water diverted to them. The greater part of the lucerne produced in South Africa is grown in a few localities only and the crop is not distributed to best advantage over the country. The value of lucerne as a stock feed is fully discussed. It is especially valuable for use in conjunction with drought resistant fodder plants such as spineless cactus, aloes, etc. There is a fairly ready sale for lucerne hay on the continent. The economics of lucerne hay production are discussed in Part II.—Attention is called to the difficulty of exporting hay, due to its bulky nature. An outline is also given of the factors to be considered in growing the crop so as to insure the largest yield without material increase in cost of production.—*L. I. Goldblatt*.

1391. WALLACE, T. *The manuring of poor pastures in the Bristol Province*. *Univ. Bristol Ann. Rept. Agric. and Hort. Res. Sta.* 1923: 26–37. 1923.—A discussion is given of the results of other workers with old pastures and of the problem in the Bristol Province. There are also tables giving the results of mechanical analyses and analyses of soils in various sections for moisture, organic matter, available potassium, available phosphorus and calcium carbonate. The results of a number of trials in improving pastures in various soils are also included. In a large number of the soils, application of phosphorus as basic slag caused improvement. This was true both in soils high in calcium carbonate and in acid soils, though the author does not consider the data adequate to justify a conclusion that, with all acid soils low in phosphorus, basic slag alone will cause such benefits. There was little improvement where lime alone was applied to acid soils.—*W. H. Chandler*.

1392. WENHOLZ, H. *The storage of maize*. *Silos on the Atherton tableland, Queensland*. *Agric. Gaz. New South Wales* 36: 533–543. 2 fig. 1925.—These silos, built for the storage of shelled corn, have been of value to farmers in marketing. It was found that when the tanks were filled completely to the top and packed, thus excluding air, no weevil treatment was necessary. Under such conditions live weevils worked their way to the top and were eventually found dead when the tank was opened.—*L. R. Waldron*.

1393. WHITTET, J. N. *Clovers and lucerne in pastures*. *The value of clovers in crop rotation*. *Agric. Gaz. New South Wales* 36: 641–647. 9 fig. 1925.—Recommendations are given for the best varieties and species of legumes for different regions. Where alfalfa thrives,

it is recommended over Subterranean clover (*Trifolium subterraneum*). Strawberry clover (*Trifolium fragiferum*) and Shearman's clover (*Trifolium fragiferum* var.) are recommended only for more moist areas. Berseem and crimson clovers are not recommended.—*L. R. Waldron*.

1394. WIANCKO, A. T. Management of the light colored clay and silt loam soils. Purdue [Indiana] Agric. Exp. Sta. Circ. 115. 1-20. Fig. 1-5. 1924.—The value of clover in the rotation and the influence of fertilizers on corn, wheat and hay yields in southern Indiana are shown by yield tests, 1914-1922.—*M. W. Gardner*.

1395. WOOD, ALFRED. The British sugar industry. Internat. Sugar Jour. 27: 406-408. 1925.—The British Sugar Subsidy Act, which became a law March 27, 1924, is analyzed, its working described, and results of its application are outlined. The difficulties which will retard the industry, as set forth by the British Beet Sugar Society, are (1) shortage of beets to work the factories at full capacity; (2) shortage of labor, particularly at the critical periods of the crop; (3) prohibitive carriage rates to factories, and (4) building factories too close to each other.—*Nellie E. Fealy*.

1396. YODER, P. A. Hot-water treatment of dormant and sprouted seed cane. Internat. Sugar Jour. 27: 359-361. 1925.—It has been found that treatment of seed cane in water at 50° C. for 20-30 minutes greatly stimulates dormant eyes on the cane in addition to killing insect pests, but in cane that had sprouted to a considerable extent, treatment in water at this temperature for 30 minutes killed nearly all the eyes. A milder treatment for sprouted cane, consisting of preheating the cane for 20 minutes at 46° and then heating for 10 minutes at 51° killed the insect pests and did not noticeably injure the open-air sprouts. With the following treatment of cuttings 10-15 inches long—made to determine the effects of hot-water treatment on the eyes regardless of efficiency in killing insects—more than  $\frac{1}{2}$  the eyes were killed: (1) Preheating 20 minutes at 45°C. and then 10 minutes at 50°C.; (2) preheating 20 minutes at 46° and then 10 minutes at 51°; and (3) heating 20 minutes at 50°. In each case the cuttings were planted in well-pulverized soil immediately after removal from the water.—*Nellie E. Fealy*.

#### SOIL SCIENCE (EDAPHOLOGY)

1397. BEAR, ERNEST M. Methods of orchard soil management. Jour. Ministry Agric. Great Britain 31: 166-174. 1924.—High cost of labor and other factors of increased expense have resulted in a change in methods of orchard management in England since the war. Clean cultivation is less commonly employed than formerly, or is being performed to a larger extent with the use of horse- or motor-drawn off-set implements designed to work close under the tree branches. Previous clean cultivation practice utilized considerable hand labor in digging or hoeing between trees in the winter. While clean cultivation is practised during the earlier development of the trees, more orchards are now kept in grass sod after the trees have reached 7 or 8 years of age. Up to this time clean cultivation is necessary for the best development of the tree and to bring it to normal though not necessarily maximum fruiting condition. Clean cultivation favors superior fruit flavor, but advantages in coloring are with grass cover. Except in dry seasons grassed orchards are considered to produce more uniformly developed fruit, and of better keeping quality. Most cherry orchards are kept in grass, while plums generally do better on cultivated ground. Where leaf scorch is troublesome among apples, grass cover sometimes proves a remedy.—Hogs or hogs and poultry are considered more desirable than sheep or cattle for pasturing excess grass growth in orchards because they keep the growth down reasonably well under the trees, do no harm by browsing on the branches, and assist in destroying injurious insects.—The sod-mulch system of cultivation as used in America, consisting of 1-2 mowings of the grass growth, and allowing the cut grass to remain on the ground as a mulch, is not extensively employed in England.—The sod-strip method wherein clean cultivation is practised between tree rows, and sod mulch or cover crops to be occasionally turned under, between trees in the rows, offers some promise of securing the advantages of both systems.—*J. E. Lapham*.

1398. BLACKWELL, C. P., AND T. S. BUIE. Fertilizer experiments. South Carolina Agric. Exp. Sta. Bull. 209. 1-78. 51 fig. 1921.—This is a report on some fertilizer experiments conducted on an Orangeburg, very fine, sandy loam soil at the Pee Dee Branch Exp.



Sta. Florence, South Carolina. The soil was in a high state of fertility when the work was started. Acid phosphate, ground rock phosphate, and Thomas phosphate gave equally good yields at the rates used in this experiment in the absence of the boll weevil, but acid phosphate gave the earliest crop. Eight per cent of acid phosphate in a 1000-pound application gave the maximum yield of cotton. Corn and cowpeas grown in a rotation with cotton gave no increase from applications of phosphoric acid. Oats gave a small increase for 4% but none for additional amounts. Blood alone as a source of ammonia was better than  $\frac{1}{3}$  blood and  $\frac{2}{3}$  cottonseed meal. For cotton, 4% ammonia was better than less or more. Corn and oat yields varied directly with the ammonia applied but the yield of cowpeas was not affected by this material. The time of application of sodium nitrate as a side dressing made no difference in the yield of any of the crops. The soil already contained enough nitrogen for maximum crops. Two per cent of potash produced maximum yields of cotton in a rotation and 4% where grown continuously. Corn, oats, and cowpeas did not respond to potash. Muriate and kainit were of equal value. Caustic lime and ground limestone gave equal results when applied at the rate of 1000 and 2000 pounds, respectively, but neither was profitable for any of the crops. At the end of 6 years the rotation series of plots was yielding about twice as much as the continuous cotton series even where complete fertilizer was used at the rate of 1000 pounds per acre. Both very light and very heavy applications of ammonia and heavy applications of potash delayed maturity of cotton.—*C. A. Ludwig.*

1399. CULLINAN, F. P. Recent soil management studies in Indiana. Trans. Indiana Hort. Soc. 1924: 66-71. 1925.—This is a discussion of straw mulch, tillage with cover crop, and sod, and their relative value under Indiana conditions.—*Author.*

1400. EHRENBERG, PAUL. Die Kalkdüngung vom wissenschaftlichen Standpunkt. [Liming from the scientific standpoint.] Mitteil. Deutsch. Landw. Ges. 40: 782-791. 1925.—A review giving in some detail the knowledge of the causes of lack of lime, the effect of lime on the absorption of other plant nutrients, the lime-magnesia theory, lime-loving and lime-hating plants, and chemical, physical and biological reactions in soils influenced by presence or absence of lime. The forms of lime are also briefly described.—*A. J. Pieters.*

1401. ITANO, ARAO. Biological investigation of peat. Jour. Bact. 10: 87-95. 3 fig. 1925.—There are here reported studies of the work of bacteria in rendering more available the nitrogen contained in peat. The hydrogen ion concentration of the peat requires to be adjusted for the best efficiency of the bacteria, the acidity being in many instances too high. Lime applications are therefore of advantage as are also the addition to the peat of some nutrient food and vitamins for stimulation of the growth and activity of the bacteria. The author's experiments show that molasses and vitamin B when employed on peat of proper acidity reaction give the highest percentage of nitrogen.—*J. E. Lapham.*

1402. MEHER. Die Praxis der Kalkdüngung. [Practical liming.] Mitteil. Deutsch. Landw. Ges. 40: 791-793. 1925.—Advice on how to spread and use the different forms of lime.—*A. J. Pieters.*

1403. RUSSELL, JOHN. Soil improvement. Jour. Ministry Agric. Great Britain 31: 120-127. 1924.—Soil improvement is discussed in a popular way under the headings of water supply, soil aeration, cultivation, depth of soils and reaction of the soil.—*M. B. McKay.*

1404. WELLS, C. F., AND B. A. DUNBAR. A study of essential plant foods recoverable from the manure of dairy cows. Jour. Agric. Res. 30: 985-988. 1925.—Four dairy cows—Jersey, Ayreshire, Guernsey, and Holstein—were fed rations composed of corn silage, oats, corn and oil meal, as constants, and the variant feeding materials were, soy-bean hay during the 1st digestion trial and alfalfa during the 2nd trial. During the 1st digestion trial, the amount of potash recovered in the manure lies between 53% and 96% of the total consumed in the feed. Phosphates range between 44% and 50%; nitrogen, between 61% and 72%. In the 2nd trial, the potash varies from 78% to 94%, phosphates 29% to 36%, and nitrogen, 68% to 74%. It was found that the amount of nitrogen, phosphorus and potash voided depended on the milk production.—*B. A. Dunbar.*

1405. WIGGANS, R. G. Experiments in crop rotation and fertilization. New York [Cornell] Agric. Exp. Sta. Bull. 434. 3-56. Fig. 1-4. 1924.—A series of cropping systems including oats, wheat, potatoes, grass and clover in various combinations was undertaken in 1914.

With the exception of timothy, all crops gave higher yields when grown in a rotation than when grown continuously. Grass should not be grown longer than 5 or 6 years and if practised, should receive dressings of manure or fertilizer. The best rotations included red clover which is more valuable than timothy, and where grass is included it should be accompanied by a legume. It is not advisable to follow grass with oats, due possibly to the presence of organic matter which is more readily eliminated by a cultivated crop. While fertilizer and manure increased production, it is unwise to make heavy applications on all crops. "Good crop rotations without manure were practically as effective in maintaining the production of oats and wheat as were heavy applications of complete fertilizer on crops grown in continuous culture; while the best rotation without manure was practically as good as a heavy application of fertilizer combined with a medium application of manure on crops grown continuously." The method of calculation employed is given in the appendix.—*W. O. Gloyer.*

## BIBLIOGRAPHY, BIOGRAPHY AND HISTORY

CARROLL W. DODGE, *Editor*

CHARLES A. WEATHERBY, *Assistant Editor*

(See also in this issue Entries 1327, 1513, §1633, 1769, 1832, 2042, 2111)

1406. ANONYMOUS. *Death of Truman G. Palmer, the statistician.* Internat. Sugar Jour. 27: 346. 1925.—Truman G. Palmer, executive secretary of the American Beet Sugar Association, died in May in his 67th year. As a sugar statistician Palmer's loose-leaf perennial, "Concerning sugar," which has been running about 10 years, has supplied the most complete set of figures extant, on the development of the world's sugar industry. The hope is expressed that this work will be continued.—*Nellie E. Fealy.*
1407. ANONYMOUS. *Franklin Tauner Pember.* Amer. Fern Jour. 15: 24. 1925.—Franklin Tauner Pember, active in building up natural history collections, died at his home in Granville, New York, March 6, 1924.—*E. R. Walker.*
1408. ANONYMOUS. *Marine Biological Laboratory dedication exercises, July 3, 1925.* Science 62: 271-280. 1925.
1409. ANONYMOUS. *Miss Mina Keyes Goddard.* Amer. Fern Jour. 15: 24, 25. 1925.—Miss Mina Keyes Goddard, active in collecting botanical specimens, died at Lexington, Massachusetts, August 30, 1924.—*E. R. Walker.*
1410. ANONYMOUS. [Rev. of: LIBRARY ASSOCIATION. *The subject index to periodicals, 1921. K. Science and technology.* 126 p. Grafton & Co.: London, 1924.] Nature 116: 274-275. 1925.
1411. GRAGGER, ROBERT. *Ein Band der wissenschaftlichen Vereine in Ungarn.* [A merger of the scientific societies in Hungary.] Minerva-Zeitschr. 1: 144-145. 1925.
1412. KOCH, HERBERT. *Die Dritte Panamerikanische Wissenschaftliche Kongress in Lima.* [The third Pan American Scientific Congress in Lima.] Minerva-Zeitschr. 1: 127-129. 1925.
1413. LORD, E. L. *Plant breeders of Florida.* Florida Fruits & Flowers 3<sup>3</sup>: 57, 65. 1925.—This is an account of the life and work of Henry Nehrling who for many years maintained an experimental plant garden at Gotha, Florida, and later moved to Naples, Florida, upon becoming interested in the breeding of fancy-leaved Caladiums.—*Arthur S. Rhoads.*
1414. OSTENFELD, C. HANSEN. *Botanisk Have gennem 50 Aar 1874-1924.* [The botanic garden through fifty years 1874-1924.] Arbejder Bot. Have [København] 104. 1-101. 38 fig. 1924.—The director has detailed the development of the present botanic garden of the University of Copenhagen from the time of its establishment. Consideration is given to the garden and greenhouses, museum and library, laboratory, and the scientific staff. Some of the more interesting plant exhibits are described. Data are furnished regarding the annual use of the garden, library, etc., by students, public, free seed distribution and herbarium and museum additions.—*Berwind Kaufmann.*
1415. PORTER, C. E. *Museen in Santiago de Chile.* [Museums in Santiago, Chile.] Minerva-Zeitschr. 1: 129-131. 1925.



1416. WITTICH, E. *Die Museen Mexikos*. [Museums of Mexico.] *Minerva-Zeitschr.* 1: 134-135. 1925.

1417. ZANGHERI, P. *Il naturalista forlivese p. Cesare Majoli (1746-1823) e la sua opera "Plantarum collectio."* [The naturalist from Forlì, Cather Cesare Majoli and his work, "Plantarum collectio."] *Nuovo Gior. Bot. Italiano* n.s. 32: 115-205. 1925.—Majoli was born in Forlì, Italy, in 1746. He was a monk of the order of Gerolimini, and taught for some time philosophy and theology in Rome. He was intensely interested in the Natural Sciences to which he devoted all his spare and finally all his time. His works cover a wide field, namely, botany, entomology, ichthyology, ornithology, agrostography, etc., and are all handwritten and illustrated by Majoli. His principal work is "Plantarum collectio," also unpublished, consisting of 27 volumes in folio 40 × 23 cm., 13,000 pages with 4500 plates in color, written between 1790 and 1810 and describing and illustrating about 5000 plants collected by him in Italy. The biographer lists, with notes on the locality of collection, all the plants described in "Plantarum collectio."—*P. D. Caldis*.

## BOTANICAL EDUCATION

C. STUART GAGER, *Editor*

ARTHUR H. GRAVES, *Assistant Editor*

(See also in this issue Entries 1500, 1538, 1554, 1634, 1968, 2020, 2143)

1418. ANONYMOUS. *Botanic garden trips a high school requirement*. Brooklyn Bot. Gard. Rec. 14: 122. 1925.—Pupils in Biology I, Stuyvesant High School, New York City, are all required to visit the Brooklyn Botanic Garden. Extra credit is given.—*C. S. Gager*.

1419. ANONYMOUS. *Evolution and intellectual freedom*. *Nature* 116: 69-83, 102-105, 172. 1925.—This contains comments by a number of prominent men on the movement in parts of the U. S. A. to prohibit the teaching of evolution in the schools.—*O. A. Stevens*.

1420. ANONYMOUS. *Prospectus of courses, lectures, and other educational advantages offered to members and to the general public, 1925-26*. Brooklyn Bot. Gard. Rec. 14: 127-147. 1925.

1421. ANONYMOUS. *The new Mauritius College of Agriculture*. *Internat. Sugar Jour.* 27: 346-348. *Fig. 1*. 1925.—The practice of taking 1 or 2 pupils for training as agricultural chemists, which was started 35 years ago at the Station Agronomique and extended on creation of the Department of Agriculture in 1913, culminated in the Mauritius College of Agriculture, inaugurated March 12, 1925, and which is to be a training school not only for factory chemists but also for estate employees and future administrators and managers. Funds for the college were provided by the planters from a special taxation, the amount for building coming from the Improvement and Development Fund and the amount required for working expenses from a special export tax on sugar.—*Nellie E. Fealy*.

1422. ANONYMOUS. *Truth and doctrine in science and religion*. *Nature* 116: 83-84. 1925.

1423. ANONYMOUS. *The realm of plants*. [Rev. of: BOWER, F. O. *Plants and man: a series of essays relating to the botany of ordinary life*. xii + 365 p. Macmillan & Co.: London, 1925.] *Nature* 116: 304-305. 1925.

1424. ANONYMOUS. *Science in boys' schools: the administrative aspect*. [Rev. of: ENGLAND, BOARD OF EDUCATION. *Report of an enquiry into conditions affecting the teaching of science in secondary schools for boys in England*. 28 p. H. M. Stationery Office: London, 1925.] *Nature* 116: 37-38. 1925.

1425. ANONYMOUS. *Science on exhibition*. [Rev. of: ROYAL SOCIETY, COMMITTEE OF. *Phases of modern science*. vii + 232 p. Published in connection with the Science Exhibit, British Empire Exhibition, 1925. A & F. Denny: London, 1925.] *Nature* 116: 303-304. 1925.

1426. BATHER, F. A. *The Field Museum of Natural History, Chicago*. *Nature* 116: 185-186. 1925.—This is a review of the report of the museum for 1924, and includes some comparisons with the British Natural History Museum. The author finds the staff of the Field

Museum hardly  $\frac{1}{2}$  as large as that of the British, and its expenditure for the past year about  $\frac{1}{8}$  larger.—*O. A. Stevens.*

1427. COLTHURST, IDA. *Familiar flowering trees in India.* 161 p. *Illus., col. pl.* Thacker, Spink, & Co.: Calcutta and Simla, 1924.

1428. CORNE, F. E. *Ferns—facts and fancies about them.* IV. *Amer. Fern Jour.* 15: 13-16. 1925.—This summarizes the characters by which ferns may be distinguished from fern-like flowering plants.—*E. R. Walker.*

1429. DAVIS, WATSON, AND FRANK THONE. *Science and intellectual freedom.* *Nature* 116: 234. 1925.—This is a brief statement of the Scopes trial at Dayton, Tennessee.—*O. A. Stevens.*

1430. GRESS, E. M. *Preservation of wild flowers in Pennsylvania.* *Pennsylvania Dept. Agric. Gen. Bull.* 399. 1-17. *Fig. 1-8.* 1925. (*Bull. Pennsylvania Dept. Agric.* 83. 1925.)—A list of 65 flowering plants and ferns said to need protection in Pennsylvania. Protection is especially necessary for all plants of the orchid family, and all species of *Trillium*.—*H. W. Thurston, Jr.*

1431. GUNDERSEN, ALFRED. *Some questions relating to the classification of flowering plants.* *Brooklyn Bot. Gard. Leaflets* 13<sup>10</sup>: 1-4. 1925.—Besides a statement of some of the principal problems, this includes a summary of the probable courses of evolution among the flowering plants, with a diagram showing the branching out of characters as they appear in the various plant families.—*A. H. Graves.*

1432. HARRIS, J. ARTHUR. *Activities of the Department of Botany, University of Minnesota, 1924.* 32 p. *Univ. Minnesota: Minneapolis, Minn., 1925.*—This describes the facilities for research and the investigations in progress at the University of Minnesota. A bibliography of publications by the department during 1924 is appended.—*A. H. Graves.*

1433. LANE, H. H. *Evolution and Christian faith.* xi + 214 p. *Princeton Univ. Press: Princeton; Oxford Univ. Press: London, 1923.*—"This book has been written to meet the need of the man or woman who is troubled by the idea . . . that acceptance of the results of modern science involves the repudiation of long-cherished religious beliefs. . . . It is an attempt at an interpretation of reality compatible with idealistic realism. . . ." The subject matter is discussed under the 2 main headings: Science, and philosophy. A list of suggested readings is included.—*Frederick V. Rand.*

1434. OLIVER, C. E. *Autobiography of the wheat berry.* *National Miller* 30<sup>9</sup>: 18-19. 2 fig. 1925.—A popular account of the wheat kernel as the source of flour, containing a discussion of its botanic structure and also averages of chemical analyses.—*Carleton R. Ball.*

1435. WILSON, E. H. *The Arnold Arboretum.* 123 p. *Illus. Frontispiece + 50 pl.* Stratford Co.: Boston, 1925.

## CYTOLOGY

GILBERT M. SMITH, *Editor*

(See also in this issue Entries 1382, 1638, 1642, 1648, 1649, 1657, 1676, 1677, 1682, 1687, 1689, 1690, 1720, 1721, 1723, 1819, 1835, 2041, 2129)

1436. BELLING, JOHN. *The attraction between homologous chromosomes.* *Nature* 116: 244. 1 fig. 1925.

1437. KOMURO, HIDEO. [The nuclei and their chromosomes in the root tips of *Trillium*.] (Japanese.) *Bot. Mag. Tôkyô* 38: (171)-(174). 1924.—There are many questions concerning the chromosome structure. The author doubts the alveolization and vacuolization of chromosomes. Using Flemming's (Benda), Bouin-Allm's, and Merkel's fixatives he found that Flemming's fixative is always bad and that Bouin-Allm's causes a conspicuous alveolization or vacuolization as compared with Merkel's fixative. Thus he is inclined to regard the nature of the fixation medium as of great importance in the alveolization and vacuolization of chromosomes at the time of fixation. Since protoplasm is a colloidal substance the problem of chromosome structure must be studied from the standpoint of colloid chemistry as well as from the morphological viewpoint. The following environmental factors of the living protoplasm at the time of fixation are considered to be of great importance: (1) The



nature and temperature of the fixation medium, (2) the pH value of the fixation medium, (3) the nature of the distilled water used in its preparation, (4) the time and temperature of fixation.—*Author*.

1438. KOMURO, HIDEO. Die Kerne und ihrer Chromosomen in den Wurzelspitzen von Trillium. [The nuclei and their chromosomes in the root tips of Trillium.] Bot. Mag. Tōkyō 38: 134-135. 1924.—(A summary of the preceding entry.)

1439. KOSER, S. A., AND J. H. MILLS. Differential staining of living and dead bacterial spores. Jour. Bact. 10: 25-36. 1925.—The method of G. S. Burke, whereby she differentiated living from dead spores of *Bacillus botulinus* was found serviceable for several aerobic species as well. In heating spore suspensions it was found that the spores became penetrable to the dye just after they were rendered incapable of germination on subsequent inoculation into a fresh medium.—*C. E. Skinner*.

1440. MOLISCH, HANS. Botanische Beobachtungen über Japan. [Botanical observations concerning Japan.] Sci. Repts. Tohoku Imp. Univ. [Sendai] Ser. 4. 1: 73-81. 1 pl. 1924.—The author has found and described distinct elaioplasts in *Botrychium ternatum* and *Ophioglossum vulgatum*. Especially beautiful elaioplasts occur in the epidermis of the petioles and leaf blades of *Botrychium*. They resemble the cell nucleus in the spireme stage and could easily be mistaken for it. The cell nucleus generally lies nearby and stands out less clearly.—The elaioplast arises from a number of granular and knotted formations of plasmatic appearance and often occupies the whole cell. Osmic acid is especially adapted to fixing it and making it quickly visible; thus treated it becomes black or bluish-black. Under low magnification the elaioplasts appear as coal black dots and each cell contains them. As shown by the reactions worked out by the author, the elaioplasts are extraordinarily distinctly formed. The same bodies are also found in *Botrychium virginianum* and *Ophioglossum vulgatum*. The presence of elaioplasts in *Botrychium* and *Ophioglossum* is a good example of the fact that certain features of the cell contents can show relationships of plants.—*Author* (Courtesy Japanese Jour. Bot.).

1441. OGHA, ICHIRŌ, AND YOSITO SINOTŌ. Cytological studies on *Sciaphila japonica*, Max. I. On chromosome. Bot. Mag. Tōkyō 38: 202-207. 6 fig. 1924.—The haploid number of chromosomes counted in the pollen- and embryosac mother-cells of *Sciaphila japonica*, 1 of the 2 Japanese species of Triuridaceae, is 24; the diploid number, 48. In an endosperm nucleus a triploid number of chromosomes, namely 72, can be counted.—The chromosomes are of 3 conspicuously different sizes. Of the 24 gemini, 2 are strikingly large, 2 are medium sized, and 20 are small.—Pairing of chromosomes is to be recognized.—The shape of the chromosomes is rod-, V-, band-shaped, etc.—The position of arrangement of large gemini and large univalent chromosomes in a nuclear plate is generally peripheral, while the intermediate ones take the position at the periphery or among the small ones.—It is suggested that *S. japonica* is tetraploid.—*Authors* (Courtesy Japanese Jour. Bot.).

1442. YAMAHA, GIHEI. Ueber die Anwendung der Becherschen Beizenfarbstoffe auf die Pflanzenkaryologie. [The use of Becher's mordant stains in plant cytology.] Bot. Mag. Tōkyō 38: 61-75. 1924.—The author studied, with root tips of *Vicia faba* and anthers of *Lilium speciosum* as test material, the following anthraquinone and naphthaquinone dyes that Becher has shown to be good substitutes for Heidenhain's iron-haematoxylin: Purpurin, Alizarin Bordeaux, Alizarin Cyanin, Alizarin Cyanin RR, Alizarin Cyanin G, Anthracene Blue, Acid Alizarin Blue, Naphthazarin, Naphthopurpurin, Alizarin Dark Green, Gallocyanin, and Gallamin Blue. The staining capacity, as well as the purity of color, of each dye is contingent not only upon the mordant medium (solution medium) but also upon the fixation agents. In alkaline solutions (0.1% color solution in 2.5% borax, with or without addition of boracic acid) a clean-cut nuclear stain is obtained only with material fixed with Bouin's or with Zenker's mixtures. In other fixatives, as Flemming's or Hermann's solutions, the nuclei stain too faintly unless previously mordanted. All results of the staining experiments are shown in tabular form. In comparison with iron-haematoxylin staining Becher's mordant stains are distinguished by their exceptionally clear quality and transparency. The author thinks that these new stains of Becher deserve a place alongside of Heidenhain's iron-haematoxylin in the technique of plant cytology.—*From author's abstract* (Courtesy Japanese Jour. Bot.).

## ECOLOGY

GEO. D. FULLER, *Editor*

(See also in this issue Entries 1362, 1497, 1498, 1499, 1507, 1525, 1550, 1582, 1587, 1589, 1595, 1599, 1600, 1610, 1615, 1696, 1735, 1747, 1749, 1798, 1825, 1833, 1844, 1845, 1847, 1849, 1883, 1888, 1909, 1914, 1961, 2052, 2116, 2117, 2118)

## GENERAL, FACTORS, MEASUREMENTS

1443. ANONYMOUS. The Red River Gum, *Eucalyptus rostrata* Schlecht. South Australian Nat. 6: 41-43. *Illus.* 1925.—The economic value of the wood is high. The plant grows in damp situations; as a weed it crowds out grain on cleared areas. Based on the chemical properties of the genus, 2 types of this species appear to exist.—*Wm. Randolph Taylor.*

1444. ANONYMOUS. [Rev. of: CANNON, W. A. General and physiological features of the vegetation of the more arid portions of southern Africa, with notes on the climatic environment. Carnegie Inst. Washington Publ. 354. viii + 159 p. 31 pl. 1924 (see Bot. Absts. 14, Entry 1204).] Nature 116: 308-309. 1925.—The reviewer finds the atmometric data somewhat disappointing.—*O. A. Stevens.*

1445. ANONYMOUS. A vegetation map of Venezuela. [Rev. of: PITTIER, HENRI. Mapa ecologico de Venezuela que demuestra las zonas naturales, los cultivos, las vias de comunicacion y los principales centros mineros, etc., [and accompanying text]. Caracas, 1920.] Geog. Rev. 12: 300-302. 1922.—The review notes changes in relative proportion of woodland and agricultural land, the latter being much reduced, and the characteristics of dry woodlands, monsoon forests, tropical rain forests, and temperate forests, and of the llanos.—*Philip C. Wakeley.*

1446. BELYEA, H. S. Wind and exposure as limiting factors in the establishment of forest plantations. Ecology 6: 238-240. 1925.—This reports results from a plantation of *Pinus strobus* and *P. resinosa* established in 1920 near Syracuse, New York (U. S. A.). The latter proved the more resistant to wind desiccation. Repeated winter killing of foliage by winds may kill young trees on exposed sites and exclude trees from shallow soils. Growth and yield are affected by wind, hence it should be considered in selecting a site for planting.—*T. J. Fitzpatrick.*

1447. BENNETT, HUGH H. Some geographic aspects of Western Ecuador. Ann. Assoc. Amer. Geog. 15: 126-147. 4 fig. 1925.—This contains notes on climate and vegetation.—*Geo. D. Fuller.*

1448. CHURCH, A. H. Introduction to the plant life of the Oxford [England] district. II. Annual succession (Jan.-June). III. Annual succession (July-December). Bot. Memoirs 14. 1-71. 16 pl. 4 fig.; 15. 1-63 p. 16 pl. Oxford Univ. Press: London & New York, 1925.—These 2 memoirs contain a careful discussion of the factors and phenomena of seasonal succession in the district under consideration. There are lists of plants developing and blooming at the different seasons, with notes on species of particular interest. The plates are excellent reproductions of good photographs of seasonal displays of vegetation usually in flower.—*Geo. D. Fuller.*

1449. CLARINVAL, AM. De la disparition brusque des invasions d'insectes. [The sudden cessation of insect invasions.] Bull. Soc. Centrale Forest. Belgique 31: 266-278, 316-335. 4 fig. 1924.—The author attempts to describe systematically the reasons why, in several cases, insect depredations of great extent and violence have been halted with astonishing suddenness at their most critical periods by natural causes. The 3 principal causes for the sudden disappearance of insect swarms are stated as: (1) lack of food; (2) climatic conditions; and (3) natural enemies. Practically no space is given to a discussion of lack of food; about  $\frac{1}{4}$  of the article deals with the climatic factors, and the remainder with the natural enemies which are described in detail.—*H. T. Gisborne.*

1450. COUPIN, HENRI. La botanique en Chemin de fer. Les causes de la répartition géographique des plantes. [Railroad botany. The causes of the geographic distribution of plants.] La Nature 1925: 122-124, 130-132, 149-150, 164-165. 1925.—As factors of distribution, the author discusses rather thoroughly and in non-technical language, water, tem-



perature, light, altitude, latitude and longitude, wind, physical and chemical character of the soil, competition, seed dispersal, man, migration and the flora of past geologic ages.—*Geo. D. Fuller.*

1451. FARROW, E. PICKWORTH. Notes on photographing vegetation. *Jour. Ecol.* 13: 329-336. 1925.—Directions are given for the selection of camera, accessories and plates, together with hints on exposure and development with special reference to photographic studies of plants.—*Geo. D. Fuller.*

1452. FREDERICQ, LEON. Dans la nouvelle Belgique. [In the new Belgium.] *Bull. Soc. Centrale Forest. Belgique* 31: 341-346. 1924.—The author—a member of the Royal Academy of Belgium—describes many of the novel and interesting features of the fauna and flora in the regions of Eupen and Malmedy, now a part of Belgium.—*H. T. Gisborne.*

1453. FRIES, THORE C. E. The vertical distribution of some plants on Nuolja (Torne Lappmark). *Bot. Notiser* 1925: 205-216. 1925.—The principal alpine plants of Scandinavia are listed with their uppermost limits in various regions including Torne Lappmark. It is suggested that the upper forest limit is a better basis of comparison than sea level. This tree limit in Scandinavia sinks greatly towards the sea, ascends decidedly in the mountain complexes and slowly descends toward the eastern part of the country. The author makes a special study of the alpine Ranunculaceae. He decides that there are actually no real upper limits, due to temperature, for vascular plants in Lapland the highest peaks (2000-2123 m.) being too low. Neither does the higher temperature seem to set the lower limits of alpine species but they are excluded because of competition. This seems to be shown by examining *Ranunculus glacialis* and *R. nivalis*, the former having its lower limit of common occurrence in snow grounds well above tree limit. Only *R. acer* and *Thalictrum alpinum* have ranges extending from the lowlands to above 1200 m. and neither reach their lower or higher limits in the district studied. Notes are given on the range of other species of Ranunculaceae.—*Geo. D. Fuller.*

1454. HARVEY, J. H. Notes on the coastal railway journey from Brisbane to Maitland. *Victoria Nat.* 41: 153-157. 1925.—The topographic character of the country is outlined and some mention made of the vegetation.—*Wm. Randolph Taylor.*

1455. HERZOG, THEODOR. Die Pflanzenwelt der bolivischen Anden und ihres östlichen Vorlandes. [The vegetation of the Bolivian Andes and their eastern foothills.] In: *Die Vegetation der Erde*. Vol. 15. viii + 258 p. 25 fig., 3 maps. Wilhelm Englemann: Leipzig, 1923.—After an account of expeditions to these mountains in 1906-1907 and 1910-1911 the author discusses the geology, orography and climate of the region, which lies between 9° and 26°S. Lat. and 16° 30' and 19°W. Long. There follows a description of the leading plants arranged by families, a summary of the vegetation types by regions and formations, a description of the vegetation of each region including a floristic analysis of each, and a brief consideration of the chief economic species. The vegetational regions mapped and described include: (1) High steppe and desert with Tola heath (*Lepidophyllum quadrangulare*) and yareta (*Azorella*), and bunch grass desert; (2) Alpine meadow ranging from rather mesophytic grasslands to a xerophytic cushion and rosette community; (3) Eastern high semi-desert with cactus and thorn scrub; (4) Northeastern slopes (north of 18°) with (a) rain forests abounding in ferns up to 1500 m., (b) to 2400-2800 m. with tree ferns, and broad leaved evergreens such as *Cinchona* spp., and (c) above that altitude a mossy or cloud forest with Ericaceae, Myrtaceae and epiphytes; (5) Eastern marginal cordilleras with deciduous forests; (6) Piedmont savana with such tree genera as *Ficus*, *Aspidosperma*, *Cassia*, *Zizyphus*, and *Fagara*; and (7) Gran Chaco, a mixture of xerophytic woodland allied to (3) and (5), with such characteristic genera as *Prosopis*, *Celtis*, *Caesalpinia*, *Schinopsis*, *Zizyphus*, *Cercidium* and *Aspidosperma Querbracho*. A floristic analysis shows that the principal elements in order of importance are the Andean, Boreal and Austral-Antarctic. An extensive bibliography is included.—*Geo. D. Fuller.*

1456. KIKUCHI, A. Variation in size and form of *Pyrus serotina*. *Bot. Gaz.* 79: 412-426. Fig. 1. 1925.—Correlations were found between the form of fruit, and the length of growing season and average temperatures in growing seasons. No correlation was established between form and size or form and monthly precipitation. It was found that the pear became

more oblate in the season previous to the maximum period of growth, there being no definite direction of variation after that period.—*B. W. Wells.*

1457. KLUGH, A. B. Ecological photometry and a new instrument for measuring light. *Ecology* 6: 203-237. 5 fig. 1925.—Light, from the ecological standpoint, may be defined as radiant energy of wave-lengths from  $300\mu$  to  $730\mu$ , as wave-lengths shorter than  $300\mu$  do not penetrate the earth's atmosphere in any appreciable amount and wave-lengths longer than  $730\mu$  produce purely temperature effects in organisms. The measurement of light is rendered difficult because light, unlike other ecological factors, varies in quantity and quality. An ecological photometer must yield data on both the total intensity and spectral quality of light, must be accurate, portable, easy of adjustment and manipulation, adapted for use in air and under water, and read directly to percentages. A brief historical review and critique of ecological photometry is presented. A new instrument for ecological photometry is described. The principle of this instrument is that panchromatic photographic plates are exposed beneath a set of neutral percentage transmission filters, the plates exposed to the lower intensities being read against the plate exposed to the highest intensity, the results being given directly in percentages. Spectrophotometric data for the filters and the plate used are given. The operation of the instrument in measuring the total intensity and the spectral quality of light in both terrestrial and aquatic habitats is described. Sources of error in this method of light measurement are fully discussed. Some data obtained with the instrument are presented.—*Author's summary.*

1458. KORSTIAN, C. F. [Rev. of: TOUMBEY, J. W., AND E. J. NEETHLING. *Insolation, a factor in the natural regeneration of certain conifers.* Yale Univ. School Forest. Bull. 11. 1-60. 18 fig. 1924 (see Bot. Absts. 14, Entry 2528).] *Ecology* 6: 315, 316. 1925.—The review calls attention particularly to the effects of sustained temperature in the surface soil and to artificial heat lesions.—*T. J. Fitzpatrick.*

1459. KUDO, YUSHUN. The vegetation of Yezo. *Japanese Jour. Bot.* 2: 209-292. 1925.—The Island of Yezo lies north of Honshu, the main island of Japan, between  $41^{\circ}24'$  and  $45^{\circ}31'$  N. Lat. The western part is mountainous although only 1 peak exceeds 5,000 feet. The eastern half has 2 broad river plains and mountains with several peaks exceeding 6,000 feet. The climate is rather moist and moderately cool, the monthly means varying from  $-10^{\circ}\text{C}$ . for January to  $20^{\circ}\text{C}$ . for August. Forests still cover more than half the whole area and are largely of the mixed broad-leaf and conifer types, the latter being more plentiful towards the north. The largest trees are *Populus Maximowiczii*, *Cercidophyllum japonicum* and *Quercus grosseserrata*, while among the most widely distributed species are *Salix jessoensis*, *Ulmus japonica*, *U. laciniata*, *Betula japonica*, *B. Ermani*, *Morus bombycis*, *Alnus hirsuta*, *Prunus serrulata*, *Tilia japonica*, *Acer pictum* and *Fraxinus pubinervis*. In addition there is a group of genera such as *Magnolia*, *Styrax*, *Picrasma*, *Ostrya*, *Carpinus*, and *Pterocarya* more common in the southern main island. Among the conifers some of the more abundant species are *Pinus pentaphylla*, *Abies sachalinensis*, *A. mayriana*, *Picea jessoensis*, *P. Glehni*, *Larix dahurica* var. *kamtschatica* and *Thujaopsis dolabrata*. Notes are given on the habits of these and other tree and shrub species. The number of woody plants is 256, including 24 woody climbers, and the entire vascular flora includes 1629 species. The principal types of plant communities are discussed, including the associations of (1) sandy and rocky shores, (2) bogs and swamps, (3) lake and river sides, (4) ponds, (5) uplands and (6) mountains. A list of all species is given, indicating the occurrence of each in different parts of Yezo and elsewhere in adjacent lands. The Pteridophytes include 30 genera with 98 species, the Taxaceae 2 genera of 1 species each, the Pinaceae 6 genera with 11 species and the Angiosperms 122 families, 559 genera and 1518 species. In the order of size and number of species, some of the larger families are: Cyperaceae 142, Gramineae 117, Compositae 116, Rosaceae 73, Liliaceae 64, Orchidaceae 61, Ranunculaceae 55, Cruciferae 44, Umbelliferae 39, Labiatae 38, Eriaceae 38, Leguminosae 35 and Violaceae 32.—Six botanical districts are distinguished: (1) South-western Yezo, dominated by birch forests and showing close affinity to northern Honshu; (2) Southeastern Yezo, showing southern affinities but dominated by fir and spruce forests; (3) Central Yezo, with an abundance of bogs and alpine meadows but with deciduous forests



on the plains becoming mixed with conifers on the mountain slopes; (4) Eastern Yezo, with many swamps in the western portion of the district, including extensive associations of *Phragmites communis* and forests of *Abies sachalinensis* and *Picea Glehni* in the west; (5) Province of Kitami, along the northeast coast, similar to District 3 but with more northern affinities; and (6) Southern Kurile Islands, similar to District 4 but with decidedly fewer species. The relationship between the flora of Yezo and adjacent regions is indicated by 79% of its species being common to Honshu, over 38% common to each of Korea, Kynshu, Shikoku, China and Manchuria and more than 26% common to Siberia, to Europe and to North America.—*Geo. D. Fuller.*

1460. LEACH, W. Two relict upland oakwoods in Cumberland [England]. *Jour. Ecol.* 13: 289-300. 2 pl., 3 fig. 1925.—Both forests are developed on hillsides between 1000 and 1500 foot contours with slopes of 30-40° on shallow stony argillaceous soil showing a reaction of pH 5.0. They consist of *Quercus sessiliflora* with occasional trees of *Sorbus aucuparia* and with an undergrowth in which *Pteridium aquilinum*, *Vaccinium myrtillus* and *Calluna vulgaris* are often dominant. The areas known as Kirkrigg Oaks and Keskadala Oaks comprise 8 and 19 acres, respectively, and are apparently remnants of former larger areas. Although there has been no cutting for at least a century, much of the wood exhibits coppiced forms. These are probably due to the killing occasioned by ground fires. There is an almost entire failure of natural regeneration of the oaks by means of seedlings and it would seem that under existing conditions these woods will eventually disappear.—*Geo. D. Fuller.*

1461. LLOYD, BLODWEN. The technique of research on marine phytoplankton. *Jour. Ecol.* 13: 277-288. 3 fig. 1925.—Directions are given and apparatus described suitable for collecting, fixing, preserving, examining, estimating and cultivating marine phytoplankton.—*Geo. D. Fuller.*

1462. MCATEE, W. L. Notes on drift, vegetable balls, and aquatic insects as a food product of inland waters. *Ecology* 6: 288-302. 1925.—Freshets transport tons of drift which becomes an important factor in the distribution of plants. Vegetable balls are formed by wave action in shallow water which aggregates very diverse objects.—*T. J. Fitzpatrick.*

1463. MACGILLIVRAY, W. An excursion in southwest Queensland. (Contd.) *Victorian Nat.* 41: 126-140. Pl. 5. 1925.—This continues a general description of the topography and of the vegetation. [See also Bot. Absts. 14, Entry 6217.]—*Wm. Randolph Taylor.*

1464. MOUSLEY, HENRY. Further notes on Calypso. *Torreyia* 25: 54-59. 1 pl. 1925.—The underground development and variations in *Calypso bulbosa* are considered in a rather general way.—*Wm. G. McGinnies.*

1465. NOHARA, SIGEROKA. Experimental studies on pollen of some Salix. *Japanese Jour. Bot.* 2: 1-33. 8 fig. 1924.—The pollen is shown to germinate quickly, a tube of considerable length being produced in 30 minutes. Cane sugar solutions of varying strength up to 30% may be used as a culture medium. Germinating power may be retained for 70 days under dry, dark, cool conditions. Details are given of reactions to various degrees of humidity and temperature. A temperature of -21°C. does not lessen the germinating powers but one of 37° is soon fatal. Results of cross pollination are discussed briefly.—*Geo. D. Fuller.*

1466. PAPE, H. Pilz-Rhizomorphen als Hindernis in einer Wasserleitungsrinne. [Fungus-rhizomorphs clogging an aqueduct.] *Zeitschr. Pilzkunde* 44: 60-61. 1 pl. 1925.—Near Huesten, Westphalia, rhizomorphs were found growing in an aqueduct for drinking water, cut in the rock. The passage in the aqueduct is entirely dark. The branched rhizomorphic hyphae have a diameter of 1.5-2.5 mm., are smooth, dark brown or black on the outside but white within and, being attached in a few places, float in the water. They reach such a development as to clog the aqueduct to such an extent that they have to be removed at intervals. It is supposed that somewhere in the stone duct there is decaying wood which supplies the necessary organic materials for the life of the fungus. The absence of fruiting bodies has prevented its identification.—*Author (translated)*

1467. PEARSON, G. A. [Rev. of: HILEY, W. E., AND NORMAN CUNLIFFE. An investigation into the relation between height growth of trees and meteorological conditions. Oxford Forest, Mem. 1. 19 p. 3 pl. Clarendon Press: Oxford, 1922. (See Bot. Absts. 13, Entry

795).] Jour. Forest. 20: 890-892. 1922.—The authors note certain correlations of climate and height growth in plantations or scattered trees of Sitka spruce, European larch, Corsican pine, Douglas fir, arborvitae (*Thuja plicata*), western yellow pine and beech, near Oxford, England. The reviewer compares certain results to his own establishment of a correlation between April-May precipitation and height-growth of *Pinus ponderosa scopulorum* in Arizona.—*Philip C. Wakeley*.

1468. RABER, ORAN. The fourth international phytogeographic excursion. Science 62: 344-345. 1925.—Held July 2 to August 24, 1925, in Norway and Sweden. Fifteen countries (exclusive of Norway and Sweden) were represented by 28 botanists.—*C. J. Lyon*.

1469. SALISBURY, E. J. Note on the edaphic succession in some dune soils with special reference to the time factor. Jour. Ecol. 13: 322-328. 2 fig. 1925.—From the examination of a series of dunes at Southport, England, ranging in age from 2 to 280 years, it was demonstrated that there was (1) a progressive leaching of carbonates with increasing age, (2) a change from an alkaline to an acid condition (for example, a ridge 2 years old showed a pH value of 8.2; 100 years old, pH 7.2; and 280 years old, pH 6.8-5.5) and (3) an increase in organic content. These changes were accompanied by a change in flora consisting in a diminution of calcicole species and an advent of calcifuge types. The report contains details of determinations of H-ion concentration, carbonate content, and organic content of the dune soils of various ages. The results support the conclusion of the author that natural undisturbed soils in these latitudes tend to become more and more acid, to have an increasing organic content and a diminishing supply of available salts, calcium salts being the first to become markedly low in amount.—*Geo. D. Fuller*.

1470. SALISBURY, E. J. The vegetation of the forest of Wyre: A preliminary account. Jour. Ecol. 13: 314-321. 1925.—This is one of the largest areas of natural woodland in England, on the borders of Worcestershire, being about 5 miles across. The stand varies much from large trees to coppice that is cut in a 16-18 years rotation. The dominant species is *Quercus sessiliflora* and the main body of the forest is decidedly calcifuge in character. *Betula alba* is common, while *Q. robur*, *Ulmus montana*, *Prunus avium*, *Fraxinus excelsior* and *Alnus glutinosa* occur on the alluvial flats. Lists of species are given and the influence of coppicing on the density of the ground flora and on humus development is noted. In the forest are numerous old "hearths" where charcoal has been burnt; here the vegetation is more distinctly calcicole.—*Geo. D. Fuller*.

1471. SHAPOVALOV, M. Ecological aspects of a pathological problem (western yellow blight of tomatoes). Ecology 6: 241-259. 5 fig. 1925.—Since a precise knowledge of the ecology of this disease seemed indispensable to an understanding of its nature and causes, a survey of the geographical distribution and seasonal prevalence was made in the region west of the Rocky Mountains from the west coast of Mexico to British Columbia. Blight is prevalent in regions and in seasons when the evaporation rates are high. It has never been reported from the Puget Sound region while in inland portions of Washington during favorable seasons it is very serious. An unfavorable balance between transpiration and water absorption appears to have an important bearing on this disease.—*Herbert C. Hanson*.

1472. SMUTS, JAN CHRISTIAN. Science in South Africa. Nature 116: 245-249. 1925.—This is from the presidential address to the South African Association for the Advancement of Science at Oudtshoorn, Cape Province, July 6. Much further work on paleobotany in South Africa is needed to solve some of the great problems in plant geography. The writer does not favor the view that the flora of southern Africa has had a northern origin. Its affinities seem to be with other parts of the southern hemisphere and the origin may have been independent, or it may be a survival of an Antarctic flora.—*O. A. Stevens*.

1473. S[UTTON], C. S. Concerning "cushion" plants. Victorian Nat. 42: 17-19. 1925.—A comparison of the dwarfed cushion plants of Australia and New Zealand with those reported by F. W. Pennell from the Andean region, is given.—*Wm. Randolph Taylor*.

1474. TANSLEY, A. G., AND R. S. ADAMSON. Studies on the vegetation of the English chalk. III. The chalk grasslands of the Hampshire-Sussex border. Jour. Ecol. 13: 177-223. 5 pl., 15 fig. 1925.—This detailed study of the composition and successional stages of vegetation on a chalk substratum contains lists of species with their frequency, soil analyses, quad-



rat studies, the comparison of open and enclosed areas, and an examination of the root habits of several species. The vegetation was that of pasture grassland grazed by sheep and cattle and locally closely eaten by rabbits. The pioneer plants on the actual surface of the chalk were the moss, *Seligeria calcarea*, and an alga, *Chroolepus* sp. The first colonization of broken and disintegrating chalk was by open soil and grassland species rather than by lithophytes, *Festuca ovina* and mosses, largely calcicoles, playing an important part from an early stage. During the early stages with shallow soil, a very high percentage of carbonates and little humus, the variety of species is small and of xerophilous type. With increasing depth of soil and increasing humus and water content a much greater variety of herbaceous species appears and the typical richness of the chalk grassland community is developed. *Festuca ovina* remains dominant or co-dominant with *Carex flacca*. Of other grasses, *Avena pratensis* is the commonest, with *Trisetum flavescens* and *Avena pubescens* less common, *Bromus erectus* of local occurrence, and *Briza media* occasional but widely distributed. Moderately heavy rabbit attack reduces the general height of the herbage to 2.5 cm. but does not effect any great change in the composition of the vegetation, but very heavy rabbit attack reduces the number of species and at times gives moss vegetation dominance. In the absence of rabbit attack and with not too heavy grazing there is a tendency to the invasion of the grassland by such plants as *Potentilla erecta* and *Calluna vulgaris*, and such grasses as *Agrostis vulgaris* and *Holcus lanatus*, species not usually characteristic of chalk grassland.—Geo. D. Fuller.

1475. [VUL'F, E. V.] Вульф, Е. В. Растительность восточных Яйл Крыма их мелиорация и хозяйственное использование. [Vegetation of the eastern slope of the Iaila Mts., Crimea.] 166 p. 10 fig., 7 maps "Novaia Derevnia:" Moscow, 1925.

1476. WARD, F. KINGDON. Sino-Himalaya. Nature 116: 282-284. 1925.—The physiology of the region is described briefly and examples are cited from *Rhodendron*, *Primula* and *Meconopsis* to show how the Chinese and Himalayan floras meet there.—O. A. Stevens.

1477. WELSCH, JULES. Les forêts submergées du nord-ouest de l'Europe et les tourbes littorales. [The submerged forests of northwestern Europe, and coastal peat.] La Nature 1925: 91-93. 5 fig. 1925.—A brief description is given of stumps and other remains of trees found along the coasts of France, Belgium and the British Isles in deposits of peat and lignite belonging to the upper Tertiary and Neolithic age. The conclusion is reached that France had formerly a wider extension towards the west.—Geo. D. Fuller.

1478. WIGGANS, R. G. Studies of various factors influencing the yield and the duration of life of meadow and pasture plants. New York Agric. Exp. Sta. [Cornell] Bull. 424. 3-24. Fig. 1-6. 1924.—In the meadow, the length of life of orchard grass, tall oat grass and blue grass is more or less indefinite, but timothy, redbud, meadow fescue, English rye grass and brome grass are soon exterminated by competition with blue grass. A similar relation holds true under pasture management with the exception that orchard and blue grasses remain. The objection to orchard grass can be overcome by intensive grazing of small lots which prevents it from going to seed.—W. O. Gloyer.

1479. WILSON, O. T. Some experimental observations of marine algal successions. Ecology 6: 303-311. 1 fig. 1925.—Marine algal successions were studied from January to May on wooden blocks, rock surfaces, glass plates, suspended ropes, and iron weights at La Jolla, California. Colonial diatoms dominated all surfaces first, followed by hydroids or by *Ectocarpus*, and the pre-kelp stage began to appear.—Herbert C. Hanson.

#### STRUCTURE, BEHAVIOR, SYMBIOSIS

1480. HARSHBERGER, JOHN W. Notes on the Portuguese insectivorous plant *Drosophyllum lusitanicum*. Proc. Amer. Phil. Soc. 64: 51-54. 4 fig. 1925.—This plant occurs near Oporto in an open macchia community in which *Thymus caespiticius* is abundant, accompanied by other characteristic species which are listed. It has a woody base, long, slender, fibrous roots, and attains a height of 1 foot. Its linear tentaculate leaves are crowded with small flies that have been captured by the sticky secretion from the tentacles. The immovability of the tentacles seems associated with sterile arid soil.—Geo. D. Fuller.

1481. KELLER, BORIS. Halophyten- und Xerophyten-Studien. [Studies of halophytes and xerophytes]. Jour. Ecol. 13: 224-261. 11 fig. 1925.—These studies were undertaken in order to discover from an investigation of native vegetation the most suitable crop plants for certain dry alkaline areas. They seem to show that plants not only protect themselves from the unfavorable influences of their environment but even turn them to their advantage. Thus, *Salicornia herbacea* is shown experimentally to grow best under the influence of considerable salinity and under such conditions to exhibit greater resistance to water loss, higher osmotic pressure and a greater degree of succulence. The sodium salts have a stronger effect than potassium; the chlorides, than the sulphates. The most luxuriant plants have but slightly increased osmotic pressure which is increased further when there is a strong suppression of growth by a too great salt supply. *Salicornia* is shown to be a water loving halophyte and at germination almost a water plant. *Frankenia pulverulenta* is an example of a halophyte type which secretes large quantities of easily soluble salts, thus freeing the living cells from a superfluity of them. It is not, like *Salicornia*, benefited by a supply of salts, but is able to tolerate concentrations such as 1.0% of NaCl without injury, although 3-5% NaCl causes suppression of growth. Comparisons of steppe and woodland species of *Asperula* and *Galium* show a quite surprising and almost mathematical regularity of quantitative anatomical characters, the steppe species having acicular leaves, more numerous stomata, mostly on the upper sides of the leaves, thicker cuticle and more palisade tissue. The steppe species show a far greater transpiration than the woodland. Other evidence is presented showing the close parallelism between transpiration and anatomical structure.—*Geo. D. Fuller.*

1482. OYE, P. VAN. Écologie des épiphytes des troncs d'arbres au Congo Belge. [Ecology of the epiphytes on the tree trunks in the Belgian Congo.] Rev. Gén. Bot. 37: 481-498. 1924.—The development of epiphytes on the tree trunks in the Belgian Congo is similar to that found in the Dutch Indies. The most important conclusion is that the humidity of the air is the most important factor in the ecology of these epiphytes in warm countries.—Light is secondary as an ecologic factor. Only the xerophytic epiphytes which are able to live with little nutritive material develop well in the Belgian Congo. Among these, the ferns hold a prominent place. Epiphytes of other families are found only where special local environments allow them to occur. The groups of epiphytes of the tree trunks in the Belgian Congo do not present a definite succession but those of the trunks of *Elaeis guineensis* L. present a series of well marked stages, 5 stages occurring, depending on the morphology of the trunk, which influences the relative humidity.—*J. C. Gilman.*

1483. PEMBERTON, C. C. Field studies of growth forms of some of the native trees of the environment of Victoria, B. C. (Canada). Canadian Field Nat. 39: 96-105. 10 fig. 1925.—The author describes and presents photographs of fasciation and plagiotropic shoots of *Pseudotsuga taxifolia* Britt. Fantastic forms of trunks and limbs of *Quercus garryana* are described and figured, especially outgrowths that form close contacts with adjacent rocks. These are thought to be due to some unknown stimuli in the rock masses, for the tree.—*Geo. D. Fuller.*

1484. ROBERTSON, CHARLES. Honey bees and perforated flowers. Science 62: 287-288. 1925.—Specific references are made to flowers that have been perforated by honey bees as noted by Mueller, Darwin and others. The author reports that only 4 flowers have been observed by him to be perforated in the case of over 15,000 insect visits to 441 local insect flowers.—*C. J. Lyon.*

1485. WATANABE, KIYOHICO. Studien über die Koralloide von *Cycas revoluta*. [The coralloids of *C. revoluta*.] Bot. Mag. Tôkyô 38: 165-187. 12 fig. 1924.—The formation of the coralloid in *Cycas* is an hereditary character. At first it is free from algae, but soon becomes infected with an endophytic *Anabaena*. The algae penetrate into the coralloids through schizogenous intercellular spaces which they themselves have made. In the coralloids there is a starch-free layer rich in plasma into which the algae later penetrate and live in the intercellular spaces. Whether the coralloid is negatively geotropic is doubtful. Usually, and especially in poorly aerated soils, the ultimate rootlets grow aerotropically and their ends become metamorphosed into coralloids. The proteolytic enzymes are demonstrable



neither in the root tips nor in the coralloids; assimilation of free nitrogen through the coralloids is scarcely to be admitted.—Although the alga is a true parasite, it causes very little injury. It promotes the growth of the coralloid, which is to be considered as a hypoplasia. If the algae do not penetrate into the coralloid it soon degenerates.—(*Courtesy Japanese Jour. Bot.*)

### FLORISTICS

1486. BLACK, J. M. **A study in weeds.** *South Australian Nat.* 6: 30. 1925.—Lists the relative abundance of various introduced weeds as incursive on an abandoned open air theatre site.—*Wm. Randolph Taylor.*

1487. CHODAT, R., ET L. REHFOUS. *La végétation du Paraguay. Résultats scientifiques d'une mission botanique suisse au Paraguay. XIII. Nyctaginacées.* [Vegetation of Paraguay. XIII. Nyctaginaceae.] *P.* 473–509. 52 fig. Geneva, 1925.—The characteristic features and distribution of certain genera of the Nyctaginaceae are described and compared with particular reference to the species of *Pisonia*, which, as a rule, is a localized genus. *Pisonia aculeata* var. *guaranitica* is described as a new variety. This species appears to be the only one capable of acquiring a large area. It extends through South America to the Antilles. In explanation of the reason for localization of certain species and dispersal of others the Age and Area theory of Willis, that the more widely spread plants are the more ancient, is not fully accepted. Climate and soil are considered with a more detailed discussion of the morphological and anatomical features, particularly of the fruit with its mucilaginous content. The conclusion drawn is that, all other things being equal, the area most extensively covered is occupied by the species with the best methods of dissemination.—*Mildred E. Faust.*

1488. CHRYSLER, M. A. **Climbing a mogote.** *Torrey* 25: 25–29. 1925.—The mogotes are limestone hills with precipitous sides, found in western Cuba. They abound in endemics. The author describes a collecting trip and mentions some of the species collected.—*Geo. D. Fuller.*

1489. CLELAND, J. B., AND J. M. BLACK. **The plants of Encounter Bay District.** *South Australian Nat.* 6: 22–30. 1925.—This long list includes collections by the authors and others. Especially important as of new range are *Schocnus fluitans*, *Daviesia pectinata*, *Pultenaea teretifolia*, *Eucalyptus cneorifolia*, and *Triodia irritans*. A new species of *Microtis* (Orchidaceae) and *Cyperus Eragrostia* var. *pauperata* n. var. described elsewhere are mentioned as from this district.—*Wm. Randolph Taylor.*

1490. D'ALTON, C. W. **Some Grampian plants.** *Victorian Nat.* 42: 28–32. 1925.—A general discussion is given of some of the more striking of the 917 species of the Grampian Hills.—*Wm. Randolph Taylor.*

1491. GADECEAU, E. **Le peuplement végétales des sables de la Loire à Nantes.** [The plant population of the sands of the Loire at Nantes.] *La Nature* 1925: 241–244. 4 fig. 1925.—The invasion of several sandy islands is described and the species are listed with notes.—*Geo. D. Fuller.*

1492. GRIER, N. M. **Unreported plants from Long Island, N. Y. II. Cryptogams exclusive of Pteridophyta.** *Torrey* 25: 5–10, 29–35. 1925.

1493. HARD AV SEGERSTAD, FR. **The main features of the floral plant geography of southern Sweden.** *Bot. Notiser* 1925: 222–250. 15 fig. 1925.—Through it runs the boundary between Drude's eastern and western Baltic forest region; and the author distinguishes (1) the eutropic area, undulating with fertile calcareous clay soil; (2) the mesotropic area, more hilly, with grasslands and forests; and (3) the oligotropic area, poorly drained and with acid soils very common. These areas are mapped. The flora is divided into (1) shore and coast plants; (2) calcicoles; (3) eutropics, some confined strictly to their own area and others found within the mesotropic area, including species of natural areas and those in fields and waste places; (4) mesotropics; (5) oligotropics; (6) the *Herniaria* group; (7) western species; (8) southern species; (9) northern species and (10) species whose distribution is still undergoing change. In the last group, *Cirsium oleraceum*, *Carex montana*, *Leontodon hispidus*, and *Valeriana dioeca* are mentioned, while extensive lists are given for the other groups. Maps show the distribution of characteristic species.—*Geo. D. Fuller.*

1494. HARPER, ROLAND M. A botanically remarkable locality in the Tallahassee Red Hills of Middle Florida. *Torrey* 25: 45-54. 3 illus. 1925.—A description is given of the vegetation in the vicinity of Lake Miccosukee, about 20 miles northeast of Tallahassee, remarkable for the relative absence of evergreens. Special note is made of a new species, *Grossularia echinella* discovered by the author and Dr. Kurz. The species was described by F. V. COVILLE in *Jour. Agric. Res.* 28: 71-74, pl. 1, April 5 [June] 1924.—Wm. G. McGinnies.

1495. KUDÔ, YUSHUN. Report on the vegetation of northern Saghalien. (Japanese.) 295 p. 17 pl., 1 map. Published by the Military Administration of the Saghalien Expeditionary Force of Japan: Alexandrowsk, Saghalien, 1923.—The present report embodies important information relative to the flora of Northern Saghalien, which has accrued during the past 56 years, since the publication of Fr. Schmidt's "Reisen im Amurlande und auf der Insel Sachalin," in 1868. It is preceded by a historical sketch and a bibliography of 226 titles. The vegetation is characterized by a forest of *Larix dahurica* Turcz. var. *kamtschatica* Miyabe & Kudo and by the presence of Saghalien tundra. The *Larix* forest occupies a large tract of country and is most typically developed in the northern part. The Saghalien tundra is not always sharply divided from the *Larix* forest vegetation; numerous undershrubs are often mixed with it. Forests of *Abies sachalinensis* and *Picea jezoensis* are also extensive, occurring in the south and southwestern parts. The flora contains 594 species, which are listed, representing 292 genera and 80 families. From the phytogeographical point of view, the author supports the divisions suggested by Fr. Schmidt. He points out that the flora of the northern and eastern parts is related to that of Siberia, while the flora of the southwestern part is related to that of Southern Saghalien and Hokkaido. A list of the useful plants with directions for their uses is given.—Author (*Courtesy Japanese Jour. Bot.*).

1496. WHERRY, E. T. Some fern finds in Virginia. *Amer. Fern Jour.* 15: 1-7. Pl. 1-2. 1925.—The author reports extension of range for several ferns and unusual habitats for others.—E. R. Walker.

## FOREST BOTANY AND FORESTRY

W. N. SPARHAWK, *Editor*

(See also in this issue Entries 1339, 1340, 1427, 1435, 1443, 1445, 1446, 1449, 1452, 1455, 1459, 1460, 1467, 1470, 1495, 1817, 1883, 1937, 1938, 1940, 1941, 1942, 1946, 1947, 1955, 1956, 1960, 1986, 1989, 2005, 2006, 2007, 2052, 2108)

1497. ANONYMOUS. *Eucalyptus robusta* in South China. *Lingnaam Agric. Rev.* 21: 66. 1924.—A brief account is given of the introduction, establishment, and distribution of *Eucalyptus robusta* which is expected to contribute materially toward relieving the fuel shortage in South China.—Albert N. Steward.

1498. ANONYMOUS. Flax barriers to check drifting sand. *Sci. Amer.* 131: 255. 3 fig. 1924.—This is a brief description of the method employed on the west coast of North Island (New Zealand) to check drifting sand, with the ultimate aim of reforestation with conifers.—Chas. H. Otis.

1499. ANONYMOUS. Forests and rainfall. *Sci. Amer.* 131: 115. 1924.

1500. ANONYMOUS. Imperial Forestry Institute. *Quart. Jour. Forest.* 19: 42-43. 1925. The Imperial Forestry Institute at Oxford started work on October 13, 1925. The names of the Board of Governors and of the Staff of the Institute are given.—P. S. Spokes.

1501. ANONYMOUS. Service des aménagements. [Forest management during 1923.] *Bull. Soc. Centrale Forest. Belgique* 31: 346-351. 1924.—This is an outline of the forest management work of the Belgian Forest Service.—H. T. Gisborne.

1502. ANONYMOUS. Statistique des produits et dépenses des bois soumis au régime forestier. [Statistics concerning the receipts and expenses of forests under management.] *Bull. Soc. Centrale Forest. Belgique* 31: 284-288. 1924.—These statistics for 1921 show the area of land under forest management in Belgium, the net revenue, and the amount of taxes paid.—H. T. Gisborne.

1503. ACKERS, C. P. Sample plots at Huntley Manor, Gloucester. *Quart. Jour. Forest.* 19: 111-123. Pl. 1-3, fig. 1. 1925.—This is a description of sample plots from some 30 acres of



plantations in Gloucestershire, England, comprising mixtures and pure lots of Japanese larch, European larch, Douglas fir, Sitka spruce, Corsican pine, and beech, the age being 15-18 years. The soil is deep, uniform and well drained, and rests on Pre-Cambrian strata. The elevation varies between 500 and 620 feet; most of the plantations were sheltered. The cost of thinning and the volumes at 16 years are given, together with the heights of dominant trees and the numbers of trees per acre. Details of the occurrence of larch canker are given. Conclusions are drawn as to the advantages and disadvantages of the various mixtures.—*P. S. Spokes.*

1504. ADAMS, A. B. The *Zamia* palm and its destruction. Jour. Dept. Agric. Western Australia 2nd Ser. 2: 71-74. 1925.—Experiments were carried on to compare the effectiveness of kerosene and arsenite of soda in destroying the *Zamia* palm. The results are as follows: "In conclusion it may be stated that in our present state of knowledge the kerosene method of palm destruction is, for large areas, the cheapest and best. All that is necessary is to pour about an egg cup of kerosene into the centre of each palm, doing the work in dry weather, preferably in summer."—*P. J. Olson.*

1505. ALARIK, ALF. Moderna huggningsformer tillämpade på Finspong. [Adaptations of modern forms of cutting at Finspong.] Skogen 12: 211-243. 20 fig. 1925.—The Wagner system of border cuttings has been employed with marked success on the lands of the Fiskeby Co. in Sweden. Cuttings are carried back progressively toward the south and west, so that edges of mature forest face north and east, thus affording protection from sun and prevailing westerly winds and in this manner conserving moisture in the narrow clearcut strip. Prior to clear cutting, the ground is prepared to make a seedbed and the border of the stand is thinned to induce seed production. Optimum conditions for natural reproduction of both pine and spruce are found in the lee of the high forest. It is essential that young forest exist, or that openings be left on the east, and if possible on the north, to permit winds to escape.—*Henry I. Baldwin.*

1506. ALBERT. [Rev. of: SCHMID, JOSEF. Klima, Boden und Baumgestalt im beregneten Mittelgebirge. (Climate, soil, and tree form in the humid Mittelgebirge.) 124 p. Illus. J. Neumann: Neudamm, 1925.] Deutsch. Forstzeitg. 40: 744-745. 1925.—This book presents much new information, based on original investigations. Of particular interest is the demonstration that forest cover is less effective than grass in preventing surface erosion. On steep mountain slopes, however, landslides are more likely to occur with grass than with forest cover.—*W. N. Sparhawk.*

1507. ALFONSUS, ALOIS. Zu "Der Waldhonigtau." [Forest honeydew.] Wiener Allg. Forst. u. Jagdzeit. 43: 99. 1925.—This article supplements one by Woditschka (see this issue, Entry 1629). In Switzerland and parts of Germany the fir louse produces notable quantities of honeydew, especially in hot summers. This honeydew is used by bees to supplement the nectar derived from flowers.—*F. S. Baker.*

1508. ANDERSON, M. L. Thinning practice. Quart. Jour. Forest. 19: 20-27, 124-133. 3 pl. 1925.—The 3rd and 4th of a series of articles on thinning (see Bot. Absts. 14, Entry 2438). In the 3rd article the problems at each stage in the life of a wood are discussed and the varying conditions which regulate the time and strength of thinnings are noted. The treatment of plantations of Douglas fir, Japanese and European larch and Scots pine is described.—The 4th article deals with the pruning, marking and felling of trees in thinning and includes details as to time and labor required.—*P. S. Spokes.*

1509. BAEKKEN, A. O. Bestemmelse av aarringbredden. [Determination of the breadth of the annual ring.] Tidsskr. Skogbruk 33: 344-346. 1925.—The errors in increment percentages resulting from  $\frac{1}{2}$  mm. error in measurement of the annual rings are given. Use is made of a magnifying glass with a millimeter scale in the field of vision.—*W. H. Meyer.*

1510. BARBEY, A. Une forêt décimée par la neige. [A forest ruined by the snow.] Bull. Trimest. Soc. Forest. Franche Comté et des Provinces de l'Est 16: 50-52. Pl. 1. 1925.—On the night of December 25, 1923, an unusual snow fall occurred when the branches of the trees were already loaded with frozen snow; this did great damage at elevations of 1000-1200 m. in the Jura Mountains. The damage in the communal forest of Fourgs is given in detail. The forest has an area of 451 ha., with an average stand of 375 cu. m. to the ha. (0.7 spruce

and 0.3 fir). Trees of all heights up to 38 m. were up-rooted, stripped of branches or decapitated. The loss from the storm amounted to 9000 cu. m., or almost 4 times the annual cut (2354 cu. m.)—*J. Kittredge, Jr.*

1511. BECK, W. *Indtaegtsbeskatning av skog.* [Income taxation of forests.] *Tidsskr. Skogbruk* 33: 169-175, 293-303. 1925.—The Norwegian law regarding the taxation of forests is criticized as unpractical and capable of several interpretations. The principles of proper taxation are taken up. Taxation may be based upon a single year's income or growth or upon the average for a period, or it may be based upon the capitalized net income of the forest. It may also be based upon a combination of these 2 principles.—*W. H. Meyer.*

1512. BEESON, C. F. C., AND N. C. CHATTERJEE. *Economic importance and control of the sal heartwood borer.* *Indian Forest. Rec.* 11<sup>8</sup>: 223-269. 8 pl. 1925.—In 1916 an outbreak of *Hoplocerambyx spinicornis* was discovered in the *Shorea robusta* forests in the United Provinces. Trees of all sizes were attacked and killed, 45,692 trees being reported dead. Apparently the attack is correlated with an abundance of rainfall. The best remedial measure seemed to be the destruction of all slash down to 4 inches in diameter, following logging and before the rainy period. Additional measures consist of trap trees, removal of as much material from the forest as possible, and barking the logs left in the woods.—*E. N. Munns.*

1513. BEEVOR, H. *Norfolk woodlands, from the evidence of contemporary chronicles.* *Quart. Jour. Forest.* 19: 87-110. Map. 1925.—The author describes historically the woodlands of Norfolk County, England. Records go back to about 1200 A.D. and past costs and market prices are given. Many historical documents and books relating to forests are quoted. Evidence seems to show that as far back as Domesday attention was paid to the cultivation of woods.—*P. S. Spokes.*

1514. BELYEA, HAROLD CAHILL. *A suggestion for forest regions and forest types as a basis of management in New York State.* *Jour. Forest.* 20: 854-868. 1 fig. 1922.—The author divides New York State into 7 regions on the basis of dominant and indicator species and geological-physiographic characters. They are: Central Woodlot, Tug Hill, Northern Appalachian, Adirondack Forest, Northern Hardwood, Sprout Hardwoods, and Catskill Forest. Information is given on the forest areas and forest types for each region, and methods of silviculture and management are suggested.—*Philip C. Wakeley.*

1515. BEUTL, EUGEN. *Erfahrungen mit Wagner's Blendarsaum auf der Fürst Franz Liechtensteinschen Herrschaft Neulengbach.* [Experiences with Wagner's strip method of cutting.] *Centralbl. Gesam. Forstw.* 48: 1-10. Fig. 1-6. 1922.—This method, which involves frequent fairly heavy thinnings to stimulate growth and natural reproduction, and a final cutting in strips, working from the north side of the stand, gave excellent results in a mixed forest of fir, pine, spruce, beech, larch, and oak. A section of a 128-year-old fir stem is illustrated, showing that  $\frac{2}{3}$  of the basal area grew in the last 15 years, as the result of the inauguration of this method.—*W. N. Sparhawk.*

1516. BISHOP, L. L. *National forestry in Pennsylvania.* *Jour. Forest.* 20: 765-769. 1922.—This is a brief summary of the areas, plans and principles involved in the establishment of the Allegheny National Forest Purchase Unit in northwestern Pennsylvania. The unit was established in 1921, under the provisions of the Weeks Law.—*Philip C. Wakeley.*

1517. BLANFORD, H. R. *The progress of silvicultural work in Burma.* *Indian Forest.* 51: 332-344. 1925.—Planting was begun in 1856 and 1857, and has been continued in several places ever since. The taungya plantations were a valuable addition to the work, and resulted in a considerable plantation. Fire protection began about 1872. Between 1880 and 1900 the area planted increased from 1000 acres to over 4000 acres a year. Improvement and final cuttings were started about 1900 and have continued. Improvement fellings are now concentrated on the more valuable teak forests and consist in a removal of mature trees of the less valuable species.—*E. N. Munns.*

1518. BØHMER, J. G. *Vårt skogbruk.* [Our forestry.] *Tidsskr. Skogbruk* 33: 257-281. 1925.—This article deals chiefly with the treatment of selection forests in Norway. A heavier stand is continually sought for, as almost all the areas are understocked. The intensity of cuttings on each of 4 sites is described. Actual and normal increment and volume figures are compared for various provinces.—*W. H. Meyer.*



1519. BOJESSEN, H. *Selvfor yngelse af Skovfyr*. [Natural Scotch pine reproduction.] Dansk Skovfor. Tidsskr. 10: 221-227. 4 fig. 1925.—Excellent reproduction of Scotch pine is obtained by the seed tree method. The seed trees should be removed as soon as possible.—W. H. Meyer.

1520. BORCEA, I. *Dégâts causés par les Bostrychidés en Roumanie*. [Ravages caused by the Bostrychids in Rumania.] Ann. Sci. Univ. Jassy 12: 221-260. 1 fig. 1924.—A list of the harmful insects is given, with descriptive and biological notes. The most serious damage was caused by *Ips typographus* L. and *Pityogenes chalcographus* Thomps. in the forests of *Picea excelsa*.—Al. Borza.

1521. BORGES, J. F. *Le Portugal au point de vue sylvicole*. [Forestry in Portugal.] Bull. Soc. Centrale Forest. Belgique 31: 308-316. 4 pl. 1924.—The paper deals with the tree species and their distribution in Portugal, the area occupied by the principal forest species, forest products, imports and exports, and the forest service.—H. T. Gisborne.

1522. BRAGG, LAURA M. *The largest live oak*. Charleston [South Carolina] Mus. Bull. 17: 21. 1 pl. 1922.—This gives an illustration, with a few notes, of the live oak, *Quercus virginiana* Mill., on Peachtree Plantation, South Santee, South Carolina, U. S. A.—C. A. Ludwig.

1523. C. [Rev. of: LINCKE, MAX. *Das Grubenholz von der Erziehung bis zum Verbrauch*. (Mine timber, from the forest to the mine.) 422 p. 192 fig. Paul Parey: Berlin, 1921.] Centralbl. Gesam. Forstw. 48: 322-326. 1922.—The mining industry is one of the largest consumers of wood in Germany; the coal mines alone used 6,897,000 cu. m. in 1913. The book covers the subject completely, from growing the timber to its final utilization. Mine timber should be got largely from thinnings. The reviewer warns against extensive cultivation of forests for mine timber exclusively, because of the effect on prices and also the deterioration of the soil and the greater fire risk that will result from short rotations (about 60 years was suggested).—W. N. Sparhawk.

1524. CAJANDER, A. K. *Was wird mit den Waldtypen bezweckt?* [Purpose of forest types.] Acta Forest. Fennica 25. 1-16. 1923.—The purpose of the paper is to clarify ideas and viewpoints pertaining to forest types. The purpose of forest types is especially (1) to establish common quality classes of soil (Bonitäten) for the different species of trees instead of the now generally used separate quality classes for different species of trees, which causes various difficulties; (2) to establish common quality classes for the different countries, so that uniform, international forest statistics may become possible; (3) to establish natural in place of the present more or less artificial quality classes; (4) to make it possible to handle separately the numeral material of each quality class in the construction of yield tables; (5) to establish a simple but efficient method of expression for the quality of the locality; (6) to establish a foundation for applied silviculture; and (7) to establish as coherent as possible a classification of forest lands for all forestry, silvicultural, forest survey and forest policy purposes.—L. Ilvessalo.

1525. CAJANDER, A. K., UND YRJÖ ILVESSALO. *Ueber Waldtypen II*. [The forest types II.] Acta Forest. Fennica 20. 1-77. 10 fig. 1921.—The publication consists of 3 lectures delivered before the Geographical Society of Finland. In the 1st, Cajander explains the conception of forest types in general. "To the same forest type belong all forest-stands whose undergrowth—the forest being approximately exploitable and the standing crop fairly normally fully-stocked—is characterized to a more or less extent by a similar composition of species and a similar ecologic-biological character; and also those stands the vegetation of which differs from those thus defined in such manner (depending, for instance, on the different age, felling, etc., of the stand) that it may be considered as only transitory or temporary, and not permanent. Permanent differentiations create a new forest type if they are sufficiently accentuated, or a sub-type if they are less fundamental but noticeable, however." The forest types observed in Finland are described in a general way, and finally the meaning of forest types in silviculture and forest valuation is considered with reference to Cajander's fundamental publication on forest types (Ueber Waldtypen, Ibid 1. 1909).—The 2nd lecture, by Ilvessalo, deals with forest types as a basis of growth and yield tables. It is shown that the growth relations generally are different for different types, whereas in the same type they

differ comparatively little. Forest types as coherent, natural, and relatively easily distinguishable quality classes (Bonität) are generally well adapted for forest land classification, for all forest valuation and mensuration, and above all, as a basis of growth and yield tables.—In the 3rd lecture Cajander reviews the work that has been done in the elucidation of forest types. This study has opened a broad and many-sided field of investigation, in which much remains to be done.—*L. Ilvessalo*.

1526. CALVERT, E. B. **Weather forecasting as an aid in preventing and controlling forest fires.** Monthly Weather Rev. 53: 187–190. 1925.—The close relationship of weather conditions and forest fires has been noted by many observers, and the predictions of forest fire weather are becoming more accurate and useful.—*E. N. Munns*.

1527. CARY, AUSTIN. **Ideas on national forest policy.** Jour. Forest. 20: 788–794. 1922.—The author gives his views on fire control, publicly owned forests, regulation of privately owned forest by the government, popular education in forestry, the financial feasibility of private forestry, taxation, forest “devastation,” and timber and naval stores production in the southern U. S. A.—*Philip C. Wakeley*.

1528. CAVERHILL, P. Z. **Timber quantities in British Columbia.** Jour. Forest. 20: 699–713. 1922.—Analysis of various estimates leads the author to believe that British Columbia contains 350 billion (board) feet, or more, of timber, which will become increasingly accessible as prices and logging practices improve. “Given a fair degree of fire protection and reasonable utilization, we should maintain, when logging is developed throughout the whole Province, a forest industry at least equivalent to Sweden, which, after supplying the needs of 5,000,000 people, exports 2 billion feet.”—*Philip C. Wakeley*.

1529. CHATURVEDI, M. B. **The progress of forestry in the United Provinces.** Indian Forest. 51: 357–366. 1925.—There has been a steady rise of revenue from the forests. Scientific forest management has not only averted the timber famine which was threatened in the '70s, but has made it possible to ensure an ever increasing supply of forest produce. With the gradual completion of a network of railways and other improved means of communication, the accessible area has been extended. Resources which were neglected in the past have been developed by scientific research, and the forests have been greatly improved.—*E. N. Munns*.

1530. CHEN, C. [Report of the educational forestry bureau of Kiangsu Province.] (In Chinese) Jour. Ministry Agric. and Commerce Republic of China 11<sup>4</sup>: 1–6. 1924.—This bureau, the 1st of its kind in Kiangsu Province, has just celebrated its 10th anniversary. The bureau owns 120,000 mow (about 20,000 acres) of land on which 40,000,000 seedlings of different kinds are already planted. It is planned to have all the plantings done within the next 3 years for the entire area under the Bureau's administration. *Pinus massoniana* Lambert and *Quercus serrata* Thunberg are the leading species used to reforest these denuded mountain areas. Statistical reports for different working areas are given.—*C. Y. Chiao*.

1531. CIESLAR, A[DOLF]. **Die Schwarzföhre am Triester Karst.** [Black pine on the Karst near Trieste.] Centralbl. Gesam. Forstw. 48: 13–32. 1922.—*Pinus laricio* planted in 1859 on typical limestone Karst near Basovizza had an average DBH in 1914 of 21.2 cm., and an average height of 13.8 m. For 1 ha. the basal area was 42.23 square m., and the volume 345.97 cu. m. without the branches, or 443.51 cu. m. including branches. The high yield which was 2–4 times that of natural and planted stands of the same age in other parts of Austria, is attributed to the higher average temperature and greater precipitation, and also to the method of planting in widely spaced prepared spots, and the subsequent thinnings, with underplanting of fir and beech at 35–40 years. The air-dry weight of the litter under pure pine was 1.85 kg. per square m., and under pine with a beech understory, 1.66 kg. The mixed litter decomposes sooner than pure pine needles, and has a considerably greater water-holding capacity, both of which tend to stimulate growth. The plantations have already built up a layer of soil on what was practically bare limestone rock. In order to get high yields, produce valuable timber, and create a soil cover, pine plantations in the region should be converted into mixed stands by underplanting at 25–35 years with beech, silver fir, ash, or *Pinus strobus*.—*W. N. Sparhawk*.

1532. CIESLAR, A[DOLF]. [Rev. of: BORGMANN, WILHELM. **Die Begründung und Erziehung von Holzbeständen.** (The formation and tending of timber stands.) *Illus.* Paul Parey: Berlin, 1921 (?).] Centralbl. Gesam. Forstw. 48: 69–73. 1922.



1533. CIESLAR, [ADOLF]. [Rev. of: FRITSCHÉ. Ueber den Einfluss der Anbaumethode auf den Ertrag der Fichte. (Influence of method of establishment upon the yield of spruce.) Mitteil. Sächs. Forstl. Versuchsanstalt Tharandt Bd. 2, Heft 2. 1919.] Centrabl. Gesam. Forstw. 48: 60-69. 1922.—While the investigation developed no important new facts, it confirmed with exact figures what was already known in a general way, that planting gives better results than seeding, and that spacing of 1.13-1.42 m. gives the largest merchantable volume. The height of conifers, but not of hardwoods, increases with wider spacing.—*W. N. Sparhawk.*

1534. COLLEAUX, H. Excursion forestiere en 1923. La forêt de Soignes. [The forestry excursion of 1923 in the forest of Soignes.] (Continued.) Bull. Soc. Centrale Forest. Belgique 31: 214-226. 2 pl. 1924.—The silvicultural management of the forest is discussed in some detail.—*H. T. Gisborne.*

1535. COUILLAUT, C., ET H. LEGRAND. L'arbre dans nos campagnes. [Trees in our flat lands.] 196 p. 30 fig. Larousse: Paris, 1924.—The purpose of this book is to show the importance, from the economic and aesthetic standpoints, of maintaining trees and woodlands in the fields and along roadsides in lowland regions. The principal native and introduced species in France are briefly described.—*W. N. Sparhawk.*

1536. DURLAND, WILLIAM D. Results of an experiment in reproducing hardwood stands under the shelterwood method. Jour. Forest. 20: 869-871. 1922.—Four mixed hardwood (largely oak) plots on different sites near New Haven, Connecticut, were under observation for 16 years. Hardwoods on site III gave unsatisfactory yields at 75 years of age. Except for chestnut, reproduction seems assured with the shelterwood method.—*Philip C. Wakeley.*

1537. EIDE, E. Vort skogforsoksvaesen hittil og herefter. [Our forest research institute, past and future.] Tidsskr. Skogbruk 33: 321-336. 1925.—The Norwegian Forest Research Institute was established in 1917. Many permanent plots have been laid out in even-aged forests; thinning experiments have been established; dendrological studies are being carried on; mensuration studies, experiments with source of seed and introduction of exotics, investigations of seeding capacity of trees under unfavorable conditions, planting and sowing experiments have all been started. There are contemplated studies of the humus, of soil biology, of damage by animals, of various entomological and mycological questions, and numerous others.—*W. H. Meyer.*

1538. ERIKSEN, S. Vår skogbruksundervisning. [Our forestry instruction.] Tidsskr. Skogbruk 33: 281-293. 1925.—Forestry instruction in Norway is not altogether fitted for local conditions. The German influence is easily seen. Various changes in the curriculum are suggested.—*W. H. Meyer.*

1539. FARRINGTON, H. A. Report on the forest administration of the Central Provinces for the year 1923-24. Vol. 1. Report. 5 + 29 + 10 p. Vol. 2. Statements. lxxviii p. Nagpur, 1925.—The area of forest decreased to 19,680 square miles. Old working plans cover 16,072 square miles and departures from them are necessary. Additional plans are under preparation. Early burning was increased, leaving 8,563 square miles of forest under protection, of which 723 square miles burned over. An area of 3453 square miles was closed to grazing. Taungya plantations total 9175 acres. Cultural operations were carried out on 170,259 acres and thinning on 57,604 acres. The area of forest worked under various cutting methods, mostly improvement fellings and coppice with standards, was 188,792 acres. Departmental exploitation amounted to 4,614,000 cubic feet of timber, while timber sold to purchasers rose to 38,247,000 cubic feet.—*S. B. Show.*

1540. FORBES, A. C. The Japanese larch. Quart. Jour. Forest. 19: 134-138. 1925.—The author presents his experiences with Japanese larch as a forest tree in Great Britain and Ireland. Reliable conclusions are not yet forthcoming as this species has been planted for forest purposes only within the last 25-30 years, but Japanese larch cannot now be considered as a substitute for common larch, from either an economic or a silvicultural viewpoint. Its growth is compared with that of Douglas fir, Sitka spruce and *Abies grandis*. The wood does not make good pit-props and the cross section does not indicate strong or durable timber. The silvicultural requirements are dealt with. The author's present conclusion is that this species will prove of secondary value in British and Irish forestry; and that it should be planted with caution, especially in mixtures.—*P. S. Spokes.*

1541. GINSBERG, I. **Pulp and paper.** Sci. Amer. 131: 162-163. 5 fig. 1924.—This is an account of what they are, how they are made, and some of their uses.—Chas. H. Otis.

1542. GONGGRIJP, L. **Boschexploratie in Suriname.** [Forest exploration in Suriname.] Dept. Landb. Nijverheid en Handel Suriname Bull. 48. 1-103. 12 maps. 1925.—The forest conditions in Suriname are described. Much of the forest flora is still unknown.—J. C. Th. Uphof.

1543. GREELEY, W. B. **Economic aspects of our timber supply.** Jour. Forest. 20: 837-847. 1922.—The factor of transportation dominates the forest situation of the U. S. A., and the amount of timber left is less significant than its availability. Wood will be obtainable as long as the consumer can pay stumpage and transportation costs, while the increase in second-growth stumpage prices near consuming centers, as the source of virgin timber becomes remote and the demand for wood persists, will make feasible the systematic growing of timber on most of the country's 470,000,000 acres of forest land.—Philip C. Wakeley.

1544. HANSEN, T. SCHANTZ. **Cutting methods in Norway pine.** Jour. Forest. 20: 851-853. 1922.—Study on a  $\frac{1}{2}$ -acre plot in Lake County, Minnesota, indicates that Norway pine (*P. resinosa*) should be removed in 2 cuttings, a light followed by a heavy one, and that brush should not be burned.—Philip C. Wakeley.

1545. HANSEN, T. SCHANTZ. **Frustum form factor volume tables for white, Norway, and jack pines in Minnesota.** Jour. Forest. 20: 714-728. 1 fig. 1922.—Volume tables for the 3 pines, based on frustum form factors, were found more reliable than those based on taper tables.—Philip C. Wakeley.

1546. HARPER, P. H. **Poisoning trees and blackboys with arsenic.** Jour. Dept. Agric. Western Australia 2nd Ser. 2: 69-70. 2 fig. 1925.—Arsenic has been found to be effective for the destruction of York gum (*Eucalyptus foecunda* var. *loxophleba*), swamp or flooded gum (*E. rudis*), paper bark (*Melaleuca* sp.) and blackboy (*Xanthorrhoea* sp.). It is not very satisfactory for *Zamia* palm. Instructions for preparing and applying the solution are given.—P. J. Olson.

1547. HARRER. **Tanne.** [Fir.] Forstwiss. Centralbl. 47: 451-462, 477-491. Fig. 1-5. 1925.—*Abies pectinata* grows very slowly in youth, is susceptible to wind and frost, and is somewhat exacting in its requirements for atmospheric humidity and soil fertility. Several exotic species, including *A. magnifica*, *A. nobilis*, *A. grandis*, and *A. concolor* are suggested for planting on sites where the native fir will not thrive. The 2 last species are described in detail, with notes on their distribution, silvical characteristics, and growth in Germany. *A. grandis*, which grows especially fast in youth, is recommended for fairly moist, lowland sites with mild climate; *A. concolor* should do well on sites too dry or too cold for *A. pectinata*.—W. N. Sparhawk.

1548. HARTMANN, FRANZ. **Ueber die Ernährung des Waldes.** [The nourishment of the forest.] Centralbl. Gesam. Forstw. 48: 261-297. 1922.—This paper discusses the physiological processes governing the growth of trees. Disturbance of the balance between root system and crown, whether resulting from natural processes or otherwise, affects the movement of raw food from the roots and of assimilates from the crown, and is held responsible for most of the phenomena of growth. It is shown how changes in this balance influence growth, development of sprouts and suckers, stagheadedness, and natural pruning and thinning. The theory that height growth can be stimulated by growing trees in dense stands is shown to have no physiological basis, but the best growth should be made in loosely closed stands. Where the individual trees have plenty of growing space, at least through the period of maximum height growth, the best trees have a better opportunity to grow and lose less energy in overcoming the competition of their neighbors than in crowded stands. It is asserted that careless silvicultural treatment previous to the culmination of height growth affects ultimate timber production much more seriously than neglect of thinnings later on.—W. N. Sparhawk.

1549. HAUCH, L. A. **Dauerwaldtankens Anvendelse Under Danske Skovforhold.** [The adaptation of the "Dauerwald" idea to Danish conditions.] Dansk Skovfor. Tidsskr. 10: 175-190. 2 fig. 1925.—The present methods of management used in Denmark may soon result in a decrease in forest production. The "Dauerwald" idea must be more seriously con-



sidered; large clean cuttings and large areas of reproduction should be avoided. Denmark is different from other European countries in that conifers do not occur there naturally. The introduction of spruce on lands formerly occupied by beech is tending to ruin the soil. Oak forests, when there is a continuous cover of undergrowth, present a sort of "Dauerwald," but leave much to be desired. Beech must have a prominent part in the "Dauerwald" of Denmark. Contrary to A. Møller's conception, the writer admits the place and importance of small reproduction areas in this type of forest.—*W. H. Meyer.*

1550. HAWLEY, R. C., E. I. TERRY, AND K. W. WOODWARD. (Committee on Research, New England Section of the Society of American Foresters.) **Revision of a report on a forest region and type classification for New England.** Jour. Forest. 20: 795-798. 1922.—This is a revision of the forest regions and the cover types described in Jour. Forest. 20: 122-129. 1922.—*Philip C. Wakeley.*

1551. HECK. **Beiträge zur forstlichen Zuwachskunde. Dritte Teil.** [Contributions on forest increment, Part 3.] Forstwiss. Centralbl. 47: 370-377, 462-475, 538-552, 583-593. Pl. 1-4, 3 fig., 1925.—This paper deals principally with the composition of stands by tree classes. In sample plot work it is important to distinguish the different classes because of their widely different importance. A classification based on crown development (Kraft's 7 classes) and on Heck's stem forms (3 classes for each crown class) is considered the best. The ratio  $k:d$ , crown diameter : diameter breast high, may range from 8 to 56. Tables show the composition of thinned sample plots of several species, also the changes that have taken place at different periods and the basal area increment of the several crown classes. The subordinate stand (intermediate and suppressed) plays a very small part in the total increment. Tables of growth by crown and form classes show that the trees in the highest class generally stay there, while many of those in class 2 drop to class 3 or lower. The average annual diameter growth is greatest for the highest crown class and generally also varies as the form class.—Because of the "wandering" of trees from one class to another as age increases, it is not feasible to fix a standard number of trees for a unit area of a fully stocked stand of given age, even with pure stands. It must suffice to have 280-625 trees per ha. destined for the final crop (roughly 4-6 m. apart, but not necessarily evenly spaced) with enough others to serve as substitutes in case of accidents. Curves of diameter growth indicate that thinning stimulates growth, especially of the intermediate classes, but that the effect is not lasting unless the thinning is repeated.—For each crown class, the crown and breast-high areas are shown to constitute approximately the same percentage of the crown and breast-high areas, respectively, of the whole stand. The ratio,  $k:d$ , increases from the upper to the lower crown classes, although the crown width varies in the opposite direction. In a fir plot thinned to 0.9 density, the crown area, due to overlapping, was 1.3 times the ground area.—Severe pruning of open-grown spruce resulted in a decrease of diameter growth during the ensuing 20 years to only 40% as much as in the 20 years before pruning.—Several increment borings in trees of different crown classes are illustrated. It is asserted that such borings do not injure the trees, especially if the holes are plugged with clean wooden pegs.—*W. N. Sparhawk.*

1552. HELANDER, A. B. **Metsätälouden tarjoamasta ansiotyöstä.** [Employment afforded by forest management.] (German Summary.) Acta Forest. Fennica 26. 104 + 13 p. 1923.—The author shows the amount of labor required for the management of the State forests in Finland in silviculture (furtherance of natural regeneration, sowing and planting, construction of floating channels, drainage of swamps, valuation and mensuration of forests, etc.), and in felling, conversion and transportation. The labor needed per ha. of productive forest land varies from 0.05 to 7.62 days for people without horses and 0.03-1.21 days for men with horses.—*Y. Ilvessalo.*

1553. HENNIKER-GOTLEY, G. R. **Progress report on forest administration in the North-west Frontier Province for 1923-24.** 3 + 5 + 6 + iii + 27 + lviii p. Map. N. W. F. P. Govt. Printing & Stationery Office: Peshawar, 1924.—Progress was made in the preparation and revision of working plans. Fires were not serious; protective burning continued; the total extraction of timber increased. The report includes a summary of progress for the half decade, 1919-1923. The forests are worked entirely by departmental agency.—*S. B. Show.*

1554. HESKE, FRANZ, JR. **Die Wälder der Standesherrschaft Schwarzenberg.** [The

forests of the Schwarzenberg estate.] *Centralbl. Gesam. Forstw.* 48: 32-45, 135-154. 1922.—The history of these forests near Scheinfeld, central Franconia, is outlined. Chief credit for their organization and improvement is due to Josef Friedel, who took charge in 1783. He put the forests on a sustained yield basis, and gradually converted them from hardwood coppice-with-standards to conifer high forest. He also organized a school for training foresters, with a 3-year course which is outlined.—It is shown that high forest yields much more wood than coppice-with-standards (5.0-8.0 cu. m. per ha. per annum versus 4.0-5.2 cu. m.), but returns a lower rate of interest on the capital invested. The methods of converting the coppice stands into high forest are described, as well as the silvicultural methods used on the various sites. The importance of growing broad-leaved species in mixture with conifers is emphasized.—*W. N. Sparhawk.*

1555. HESSELINK, E. *Oogstberichten van boomzaden.* [Seed production of forest trees.] *Mededeel. Rijksboschbouwproefsta.* 1<sup>1</sup>: 9-10. 1922.—Comparative germination is given for the seed crop of 1921 and 1922 for *Pinus sylvestris*, *P. montana*, *Picea excelsa*, *Pseudotsuga Douglasii*, *Quercus pedunculata*, *Q. sessiliflora*, *Q. rubra*, and *Fagus sylvatica*.—*E. N. Munns.*

1556. HOLLICK, ARTHUR. *Pinus rigida.* *Addisonia* 9: 45, 46. *Pl.* 311 (col.). 1924.—This pine ranges from New Brunswick and Ontario to Alabama and Georgia and from the Atlantic coast westward to Ohio, West Virginia, and Tennessee. It is dominant in the pine barrens of Long Island and New Jersey. A description and the economic uses are given.—*T. J. Fitzpatrick.*

1557. HOMFRAY, JESTON. *Annual progress report on forest administration in the Presidency of Bengal for the year 1923-24.* 40 p. *Map.* Bengal Secretariat Book Depot: Calcutta, 1924.—The area of forests is 11,223 sq. miles of which 5,287 is reserved. Working plans for 1,853 sq. miles were completed. Fire protection was 88% successful. Natural reproduction of principal species is generally good. Thinnings were made on 3,000 acres, climber cutting on 67,775 acres, and 1,324 acres were planted. Considerable research is under way. The report includes also a summary of progress during the half decade 1919-1923.—*S. B. Shaw.*

1558. HÖNLINGER, HANS. *Zum Methodenstreit in der forstlichen Statik.* [The controversy over methods in forest statics.] *Centralbl. Gesam. Forstw.* 48: 240-245, 297-309. 1922.—The author points out mathematical defects in the valuation formulas of the forest rent theory and also those proposed by Neubauer (see *Bot. Absts.* 14, Entry 8645).—*W. N. Sparhawk.*

1559. HUFNAGEL, HANS. *Tor Jonson's Formpunktsmethode.* [Tor Jonson's form point method.] *Centralbl. Gesam. Forstw.* 47: 344-356. *Fig.* 19-21. 1921.—Jonson's method of estimating volumes of trees and stands is briefly described and the probable errors in its results are discussed. Errors may arise in measuring the diameter, in estimating the form point (focus of resistance to gravity and wind pressure, within the crown), in determining the form class, and in getting the cubic contents from the form class table. The form point may not coincide with the center of gravity of the crown because of the branching habit of the species, the variation in wind velocity (hence pressure) at different heights, the variation in density and strength of wood in different portions of the stem, the differences in character of root system, and variation in density (hence resistance to wind) of the foliage. It is concluded that the probable errors are still so large that the method cannot safely be used for individual trees, but that it is reasonably accurate for measuring stands in northern Europe. It does not yet give sufficiently accurate results for Austrian conditions.—*W. N. Sparhawk.*

1560. HUFNAGEL, L. *Plenterwald.* [The selection forest.] *Wiener Allg. Forest.- u. Jagdzeitg.* 43: 73. 1925.—This article, written primarily to correct misstatements in an article by V. R. Drassal, presents some data on the rate of growth of fir and beech in selection forests in Austria.—*F. S. Baker.*

1561. HUTCHINSON, H. P. *Research work on willows.* *Univ. Bristol Ann. Rept. Agric. and Hort. Res. Sta.* 1922: 108-109. 1922.—The problems with willows that are to be studied at the University of Bristol are concerned with classification, insects, fungi, preparation of the rods for use, and manurial treatment.—*W. H. Chandler.*

1562. ILLICK, JOSEPH S. *Pennsylvania Department of Forestry makes white pine survey of northeastern Pennsylvania.* *Jour. Forest.* 20: 830-832. 1922.—Because of the scattering



distribution of white pine and currants and gooseberries in Susquehanna and Wayne Counties, Pennsylvania, where white pine blister rust was found in 1921, the control of the disease is practical and can be accomplished at fairly low cost.—*Philip C. Wakeley.*

1563. ILVESSALO, LAURI. Raivolan lehtikuusimetsä. [The larch (*Larix sibirica*) forest at Raivola.] (German summary.) Communications Inst. Quaest. Forest. Finlandiae 5. 1-101. 14 fig. 1923.—The larch forest of Raivola in southeastern Finland is the grandest forest of northern Europe. This forest with an area of 20 ha. is the oldest larch forest and at the same time the oldest forest of artificial origin in Finland; its oldest portion was planted as early as 1738. Its original purpose was to supply ship timbers to the navy yard at Kronstadt. The trees have reached large dimensions for northern Europe, with heights over 40 m.; the volume per ha. for the best sample plot is 1824 cu. m., or twice the volume attainable by any of the native species of trees of Finland. This proves that *Larix sibirica* is one of the best foreign species of trees for cultivation in Finland. The author presents also the results of his investigations on the growth, regeneration, damage by wind, fungi, etc.—*Y. Ilvessalo.*

1564. IVORY, EDWARD P., DAVID G. WHITE, AND ARTHUR T. UPSON. Standard grading specifications for yard lumber. As recommended by the Department of Agriculture. U. S. Dept. Agric. Dept. Circ. 296. 1-75. Pl. 1-22, 1 chart. 1923.

1565. JANKA, [GABRIEL]. [Rev. of: EKMAN, WILHELM (and 10 collaborators). Handbok i Skogsteknologi. (Handbook of wood technology.) 940 p. 619 fig. C. E. Fritze: Stockholm, 1922.] Centralbl. Gesam. Forstw. 48: 327-328. 1922.—This is stated to be by far the most complete treatise that has been written on the structure, properties, and utilization of wood.—*W. N. Sparhawk.*

1566. JOHANSEN, HOLGER. A handbook of the principal trees and shrubs of the Ancon and Balboa districts, Panama Canal Zone. 97 p. 33 pl., map. 1925.—This handbook contains brief descriptive notes on most of the native and introduced trees and shrubs that are important for economic or ornamental purposes.—*W. N. Sparhawk.*

1567. KAN, ROBERT. Einfluss der Anordnung der Jahrringe nach Breite und Festigkeit auf das Widerstandsmoment des Querschnittes mit Bezug auf den Erziehungszeitraum. [Influence of width and density of annual rings on the strength of the cross-section, in relation to the period required for production.] Centralbl. Gesam. Forstw. 47: 253-269. Fig. 1-18. 1921.—The width and the density (relative proportion of spring and summer wood) of the annual rings of conifers are the resultants of both light and physical forces (weight of crown and wind pressure), effective during the life of the trees. Other things being equal, stems with narrow (dense) rings are stronger than those with wide rings. Stems with wide inner and narrow outer rings are almost as strong as those all of whose rings are narrow, and much stronger than stems with narrow inner and wide outer rings. Hence the rotation period required to produce stems of a specified size and strength can be reduced considerably by silvicultural methods that permit rapid growth in youth, but compel slower growth later. Stems produced in the same period, but with slow early and rapid late growth, are weaker.—*W. N. Sparhawk.*

1568. KIRCHER, JOSEPH. Forestry in Brazil. Jour. Forest. 20: 872-875. 1922.—Brazil is said to be 48% forested, 20% of the area being "pine," the rest hardwoods. The railroads burn wood, which is now becoming scarce along their lines. Much land has been cleared by burning, some of it only to be abandoned. Locally there is timber shortage. Several railroads and also the State of São Paulo are growing eucalypts, and São Paulo is experimenting with planting and thinning of *Araucaria brasiliana* and other species. Some botanical work is in progress, and a federal Forestry Department is provided for by law but not yet organized. No forestry seems to have been practiced in virgin stands.—*Philip C. Wakeley.*

1569. KLIMESCH, JOS. Ein forstliches Jubiläum. [Forest jubilee.] Wiener Allg. Forst- u. Jagdzeitg. 43: 68. 1925.—The ceremonies marking the 50th anniversary of the founding of the Forest Experiment Station at Mariabrunn (Austria) on July 8 are described and a brief history of the institution is given.—*F. S. Baker.*

1570. KNOUF, CLYDE E., JAMES R. WEIR, AND MELVIN S. LEWIS. Trade course in log scaling for Idaho woods. Idaho Bull. Vocational Education 5\*. iv + 108 p. 69 fig. 1922.—This bulletin is designed to aid trade teachers and lumber companies in the organization

and conduct of training courses in log scaling for men already engaged in the lumber industry in Idaho and the surrounding region. Besides chapters on the theory and practice of log scaling by Knouf, there is a chapter on the nature and cause of diseases and defects, by Weir, and a chapter on teaching log scaling, by Lewis.—*W. N. Sparhawk.*

1571. KORSMANN, C. D. *Smaaafæet og skogen.* [The smaller grazing animals and the forest.] *Tidsskr. Skogbruk* 33: 187-194. 2 fig. 1925.—If grazing is done when the forage is sufficiently developed, and before it becomes too scant, the damage to the forest is slight; but with early and late grazing, the damage varies with the quality of the forage. If the animals become accustomed to the taste of twigs and bark in their winter fodder, they will do great damage to the forest in the summer. Laws are needed in Norway to protect the forest from grazing damage.—*W. H. Meyer.*

1572. KORSTIAN, C. F., AND F. S. BAKER. Is Douglas fir replacing western yellow pine in central Idaho? *Jour. Forest.* 20: 755-764. 1922.—Sample plot studies on the Payette National Forest in Idaho, covering a period of 10 years, show that "the present composition of the forest will persist and is not being modified by new factors introduced by man (chiefly grazing) during the last 30 years. Western yellow pine will follow western yellow pine, Douglas fir, Douglas fir, and the mixtures as found today will likely continue." Cutting will favor pine as against fir in the tension zone.—*Philip C. Wakeley.*

1573. KREUTZER, E. *Ueber forstliche Bodenpflege.* [Soil improvement in forest practice.] *Centralb. Gesam. Forstw.* 48: 45-50. 1922.—Now that the principle of maximum production is supplanting the principle of maximum soil rental in forestry, the theory of financial rotation is giving way to that of commercial rotation, and more attention is being paid to maintenance of favorable soil and humus conditions. Emphasis is put on the production of individual trees of the sizes most in demand; this involves partial cutting and continuous forest, in contrast to the formerly prevalent method of clear cutting.—*W. N. Sparhawk.*

1574. L., S. *Zuwachs an der Tanne im Plenterwalde.* [Growth of the fir in selection forests.] *Wiener Allg. Forst- u. Jagdzeitg.* 43: 176-177. 1925.—This article has further bearing upon a controversy already noted, in which V. R. Drassal and L. Hufnagl have presented evidence. It contains considerable tabular material on the growth of fir in the mountains of Austria.—*F. S. Baker.*

1575. LACHAUSSÉE, E. *Travaux d'améliorations pastorales.* [Grazing management improvements.] *Bull. Trimest. Soc. Forest. Franche Comté et des Provinces de l'Est* 16: 55-61. Pl. 11. 1925.—Examples are given of 2 communities in the Jura region of France which have undertaken the improvement of their communal pasture and brush land. Certain portions have been set aside for reforestation and others for grazing. Deteriorated pastures have been cultivated and fertilized in order to improve the pasturage. Brush has been grubbed out, and shelters built for the stock at selected points. Some discussion is appended of the value of isolated trees or groups of trees in pastures as shelter for the stock, or for conserving soil moisture and contributing organic material to the soil.—*J. Kittredge, Jr.*

1576. LARSEN, J. A., AND W. C. LOWDERMILK. *Slash disposal in western white pine forests in Idaho.* U. S. Dept. Agric. Dept. Circ. 292. 1-20. Fig. 1-8. 1924.—"The quantity of slash resulting from logging operations in the white pine type in northern Idaho and the unusually dry summer conditions combine to make slash disposal a very important and necessary operation." Two methods, broadcast burning and piling and burning, are compared. Both from the standpoint of fire protection and as a silvicultural measure, the latter method is preferable in the white pine type.—*L. R. Hesler.*

1577. LEININGEN-WESTERBURG, WILHELM. *Ueber Waldtypen.* [Forest types.] *Centralbl. Gesam. Forstw.* 48: 154-164. 1922.—The author summarizes recent Finnish papers on forest types, dealing particularly with the relation between subordinate vegetation and productive capacity of the site. He agrees with several German writers on the subject, that ground vegetation over large areas in Germany and Austria is less reliable as an indicator of forest types. Soils are much more varied than in Finland, and the surface vegetation as well as the timber cover has been modified to a greater extent by man. Within comparatively small regions, surface cover is a good indicator of site quality.—*W. N. Sparhawk.*

1578. LEININGEN [-WESTERBURG, WILHELM]. [Rev. of: BUB-BODMAR, J., UND B. TILGER.



**Die Konservierung des Holzes in Theorie und Praxis.** (Theory and practice of wood preservation.) *xx + 1006 p. 4 pl., 253 fig.* Paul Parey: Berlin, 1922 (See Bot. Absts. 12, Entry 2366.) Centralbl. Gesam. Forstw. 48: 253-256. 1922.

1579. LEROY, CH. **Discovery of a new arboretum in France.** Gard. Chron. [London] III. 75: 64. Fig. 26. 1924.—The arboretum is at La Fosse, near Vendome, 100 miles southwest of Paris, and is owned by M. Gerard. A list of the more notable plants, mostly of Chinese origin, is given.—*P. L. Ricker.*

1580. LIN, D. Y. [Forestry and the flood problem in China.] (In Chinese.) Jour. Ministry Agric. and Commerce Republic of China 11: 1-4. 1924.—The author explains the rôle of forests in regulating stream flow and protecting the soil against erosion. Special emphasis is laid upon the relation between forest devastation and the frequent suffering from floods in the Yellow River region, and the need for governmental action in reforesting the denuded hills and mountains of that region.—*C. Y. Chiao.*

1581. LOOS, KURT. **Versuche und Untersuchungen über Gewichte, Masse, Vertilgungsmittel an Nonneneiern und sonstige Beobachtungen.** [Experiments and studies dealing with the weight, volume, and means of destroying eggs of the nun moth, and other observations.] Centralbl. Gesam. Forstw. 48: 110-135. 1922.—The eggs tend to be smaller and to lose weight more rapidly in dry seasons and on dry exposed sites. The jay (*Garrulus glandarius* L.) destroys large numbers of moth eggs—perhaps 20,000 in 1 day. This and other birds undoubtedly prevent many serious epidemics of forest insects.—Eggs were treated with a large number of chemicals, and several were found that prevent hatching. While most of them are out of the question because of danger to the trees or to birds, or because of the cost, kainite is effective and cheap, besides being good for the soil. Spraying the tree trunks with a 5-10% kainite solution, while the insect is in the egg stage, is recommended.—*W. N. Sparhawk.*

1582. MABER, E. D. **Reafforestation with cedar (*Juniperus procera*), Shume Forest Reserve, Tanganyika Territory.** Quart. Jour. Forest. 19: 6-12. 1925.—This is a description of a mature virgin forest of 20,000 acres in the northwestern part of the Usambara Mountains at an altitude of 5000-7000 feet, with a rainfall of about 20-30 inches. The Forest Department has been engaged in reafforestation work with cedar during the past 3½ years; the planting season is confined to the season of heavy rains from March until May. Nursery practice is described and the fungous and insect damage is noted. The method of planting and details of cost are given.—*P. S. Spokes.*

1583. MAITLAND, V. K. **Volume tables for *Tectona grandis* (teak) and *Shorea robusta* (sal) for the Central Provinces.** Indian Forest Rec. 11: 215-222. 4 pl. 1925.—These tables, based on some 2,000 teak and 1,100 sal trees, show for different sites the cubic foot contents of average trees by 6-inch girth classes.—*E. N. Munns.*

1584. MAMGAIN, DAYANAND. **Annual progress report of the administration in Ajmer nerwara Forest for the year 1923-24.** *v + 39 p.* Govt. of India, Central Publication Branch: Calcutta, 1925.—The report, besides detailing the work of the current year, summarizes the progress during the half decade 1919-1923. Fire protection is 99.7% successful. The outturn of timber and bamboos increased. The forests cover 6% of the area of the province.—*S. B. Show.*

1585. MICKLITZ. [Rev. of: DIMITZ, JOSEF. **Die Einforstung im Lande Salzburg.** (Forest rights in Salzburg province.) Zaunrith: Salzburg, 1921 (?).] Centralbl. Gesam. Forstw. 47: 363-370. 1921.—In the reviewer's opinion, more emphasis should have been put on the adoption of silvicultural measures that would result in permanent increase in production, and less on means of abolishing the "servitudes." The rights involving use of timber and pasturage present less serious problems than those involving the removal of forest litter.—*W. N. Sparhawk.*

1586. MIDDLETON, WILLIAM. **A sawfly injurious to young pines.** U. S. Dept. Agric. Farmers Bull. 1259. 1-11. 10 fig. 1922.—The larva of Leconte's sawfly (*Neodiprion lecontei* Fitch) is a serious enemy of young pines in the eastern U. S. A. While it seems to prefer *P. banksiana*, *P. resinosa*, and *P. virginiana*, it also attacks other species. The appearance, life history, and habits of the insect are described. Infestations in nurseries and parks may be controlled by hand picking the larvae or by spraying with lead arsenate; in the forest, control is generally impractical.—*W. N. Sparhawk.*

1587. MÜLLER, ERNST. **Das Kohlensäureproblem in der Forstwirtschaft.** [The carbonic acid problem in forestry.] Wiener Allg. Forest- u. Jagdzeitg. 43: 91-92. 1925.—The author presents a compilation of numerous papers bearing upon the rôle of CO<sub>2</sub> in the growth of forests. In general, the CO<sub>2</sub> content of the air averages 0.03%. It has been found that under certain circumstances this amount may vary considerably, falling much below the average in the crowns of the trees during the summer, when assimilation is going on at a rapid rate. Close to the ground under forests it may rise as much as 72% above the average, and even 4-5 feet above the ground it may be 25% in excess of normal. Its concentration in these places is doubtless due to the decay taking place in the upper soil layers. In view of the importance of CO<sub>2</sub> in the development of vegetation, it is believed that the gas given off by decaying vegetable matter on the forest floor may play an important part in determining the rate of tree growth. This has an important bearing upon the removal of forest litter, as practiced in many parts of Europe. Humus not only plays an important part in the water relations of the forests, but also in the CO<sub>2</sub> relations. Certain authors maintain that this has a large influence upon the reproduction, especially in its early years when the leaves are close to the ground. The CO<sub>2</sub> content of the upper soil layers also shows wide variation with the type of leaf litter and forest. This variation has not been accurately correlated with the growth or development of plants in their natural habitats, but it may be an important factor of forest growth.—*F. S. Baker.*

1588. MÜLLER, P. E. **Til Belysning af et Afsnit af Jaegersborg Dyrehaves Historie.** [Information on a chapter of the history of Jaegersborg game preserve.] Dansk Skovfor. Tidsskr. 10: 204-221. 1925.

1589. MUNNS, E. N. **Bear clover and forest reproduction.** Jour. Forest. 20: 745-754. Fig. 1-3. 1922.—Studies during 10 years on the Stanislaus National Forest (California) show the serious effect of bear clover (*Chamaebatia foliolosa*) on the establishment and growth of western yellow pine, sugar pine, incense cedar, and white fir seedlings in the Sierras. Apparently because its mat of fibrous roots takes up most of the available moisture, the bear clover reduces the growth rate of the seedlings by as much as  $\frac{1}{2}$ , or even prevents their establishment. Incense cedar suffers least. The spread of the clover is aided by fire and greatly impeded by heavy needle litter.—*Philip C. Wakeley.*

1590. M[URPHY], L. S. **Maine's new tax law in the toils.** Jour. Forest. 20: 826-828. 1922.

1591. OEKONOMOPULOS, ANAST[ASIOS]. **Studien und Versuche über die Harzung in Griechenland.** [Studies and experiments in extraction of resin in Greece.] Centralbl. Gesam. Forstw. 48: 85-109. Fig. 7-15. 1922.—*Pinus halepensis* covers considerable areas and the extraction of its resin is an important industry in Greece. The annual production is estimated at 8,000 tons, of which 5,000 are used in chemical industries and 3,000 in making wine. Upon standing for 30-36 hours after it comes from the tree, the resin contains crystals of pinic and oleic acids; the etherial oil is practically pure dextrorotatory pinene. The 4 methods of chipping that are commonly used (Helis, Sophiko, Kundura, Angistri) differ somewhat in the form and size of the faces and the methods of catching the resin. Experiments are described in which the "American" streak method, and various modifications of it, were compared with the Kundura and other chipping methods. The flow of resin lasted 53-296 hours, and the volume of resin flowing in an hour per unit length of streak varied directly with the average temperature for the period. There was a daily fluctuation in the rate of flow, with maxima at night and minima during the day. The best yields were obtained from shallow streaks (2-4 cm. deep), repeating each streak once after the 1st flow ceased. Resin obtained by the streak method contains 27% turpentine, compared with 17% for the chipping methods. The streak method injures the trees less than chipping and boxing.—*W. N. Sparhawk.*

1592. PEARSON, G. A. **Even-aged stands in western yellow pine.** Jour. Forest. 20: 832-833. 1922.—It is exceedingly doubtful whether western yellow pine in Arizona and New Mexico can be handled in even-aged stands, such as Weidman suggests for the Northwest (U. S. A.). The trouble lies in the precipitation, which in the Southwest is generally insufficient to mature the dense, unbroken stands of young trees which may start under favorable conditions.—*Philip C. Wakeley.*



1593. PEARSON, G. A. Seasonal distribution of rainfall as related to forest fires in Arizona and New Mexico. Jour. Forest 20: 776-779. Fig. 1. 1922.—From the Pacific eastward through Arizona and New Mexico the winter precipitation decreases and that of the spring and foresummer increases. May and June constitute the main fire season, which is usually ended by May and June rains in most of New Mexico, but seldom in Arizona. The national forests of the 2 states are classified according to the distribution of precipitation.—Philip C. Wakeley.

1594. PEIRSON, H. B. Control of the white pine weevil by forest management. Harvard Forest Bull. 5. 1-42. 3 fig. 1922.—The larvae of *Pissodes strobi* kill the leading shoots of *Pinus strobus*, and occasionally other conifers. The average stand of 2nd growth pure pine in north central New England suffers a 20% loss due to weevils. The insect, its life history and habits, various methods of control, and the character of injury done in plantations and in natural forests, are described. This paper emphasizes the possibilities of controlling the weevil by silvicultural means. It is concluded that weevil injury is largely overcome by maintaining stands sufficiently dense to prevent spreading and forking of the crowns, on sites where the trees will grow rapidly. Mixed stands of pines and hardwoods (oak, maple, and ash being preferable to birch and aspen) are less liable to injury than pure pine stands. "The best results should occur when the pine is evenly scattered through the stand and constitutes not more than 20-25% of the total number of dominant or prospectively dominant trees. A crop so constituted will produce the best quality of lumber obtainable from white pine."—W. N. Sparhawk.

1595. PERRY, GEORGE S. Preliminary results with exotic forest trees at Mont Alto, Pennsylvania. Jour. Forest. 20: 735-744. 1922.—The article consists of brief notes on the nursery behavior, growth, vigor, and general usefulness for reforestation in Pennsylvania, of *Pinus sylvestris*, *P. banksiana*, *P. edulis*, *P. contorta*, *P. ponderosa*, *P. Armandi*, *P. koreensis*, *P. pinaster*, *P. densiflora*, *P. Thunbergii*, *P. austriaca*, *Larix decidua*, *L. leptolepis*, *Picea canadensis*, *P. sitchensis*, *P. Engelmannii*, *P. pungens*, *P. abies* (*P. excelsa*), *Pseudotsuga taxifolia*, *Abies pectinata*, *Thuja orientalis*, *Cryptomeria japonica*, *Catalpa bignonioides*, *C. speciosa*, *Juglans californica*, and *Castanea mollissima*.—*Pinus sylvestris*, *P. banksiana*, *P. densiflora*, *Larix decidua*, *L. leptolepis*, *Picea canadensis* and *P. excelsa* seem the most promising.—Philip C. Wakeley.

1596. POCKBERGER, JOSEF. Die Radstädter Exotenversuchsfläche. [The Radstadt experimental plantation of exotics.] Centralbl. Gesam. Forstw. 48: 75-83. 1922.—In 1898, 2-year plants of *Larix leptolepis*, *Picea sitchensis*, *Pseudotsuga taxifolia*, *Thuja gigantea*, and *Abies nordmanniana* were planted in mixture near Radstadt, Austria. The larch quickly overtopped and suppressed the others. The height, diameter, basal area, and volume growth of 1 native and 2 Japanese larches are compared, showing that while the Japanese species grows much faster in youth, its growth culminates sooner than that of the native tree. Moreover, its wood is of inferior quality. *L. europea* should be planted within its range (in the mountains), while *L. leptolepis* does better in the lowlands. It is seldom attacked by larch canker (*Peziza Wilkommii*).—W. N. Sparhawk.

1597. PRATT, E. R. Intensive silviculture. Quart. Jour. Forest. 19: 13-19. 1925.—This is an argument against the indifferent attitude of English woodland owners toward the exploitation of forest by-products. Examples of possible income as a result of intensive silviculture are given.—P. S. Spokes.

1598. RAM, BHAG. Report of forest administration in Baluchistan for the year 1923-24. viii + 27 p. Govt. of India, Central Publication Branch: Calcutta, 1925.—The report, besides detailing the work of the current year, summarizes the progress during the half decade 1919-1923. Attempts at reforestation by sowing seed generally failed. No working plans are yet in effect, and unregulated felling of dead trees is the only cutting permitted.—S. B. Shaw.

1599. RESVOLL-HOLMSEN, HANNA. Om betydningen av birkeløvets kalkindhold. [The significance of the lime content of birch leaves.] Tidsskr. Skogbruk 33: 176-187. 1925.—Birch has a favorable effect on the forest soils in that it restricts *Nardus* and favors the better grasses and herbaceous vegetation. It also prevents the soil from becoming swampy, because the high lime content of the fallen leaves prevents the invasion of the bog-forming *Sphagnum* species.—W. H. Meyer.

1600. RIGG, GEORGE B. Birch succession in sphagnum bogs. Jour. Forest. 20: 848-850. 1922.—“The western birch (*Betula occidentalis*) is found to be a successful invader of sphagnum bogs in Whatcom County, Washington [U. S. A.], particularly in their later stages of natural succession or when modified by burning, clearing, drainage, or pasturing.” Western birch lumber is in good demand for furniture and other uses.—*Philip C. Wakeley*.

1601. RODGER, A. Forest research in India since 1875. Indian Forest. 51: 327-331. 1925.—Forest research in India began about 1881. Since 1900 there have been investigations in forest entomology, forest products, silviculture, botany, chemistry, and economics. A building was erected at Dehra Dun in 1914 and enlarged in 1920. Although much of the research is centralized at this Institute, the provinces are beginning to undertake a considerable quantity of research upon their own initiative.—*E. N. Munns*.

1602. RUSCHKA, FRANZ. Neue und wenig bekannte Chalcididen aus der Wachtlschen Sammlung. [New and little known Chalcididae from Wachtl's collection.] Centralbl. Gesam. Forstw. 47: 336-343. 1921.—Twenty new species of *Torymus*, many of them parasites of insects which injure forest trees, are described.—*W. N. Sparhawk*.

1603. RŮŽIČKA, JAROSLAV. Einige Bemerkungen über die Nonnenbekämpfung auf biologischen Wege. [Comments on combatting the nun-moth by the biological method.] Forstwiss. Centralbl. 47: 537-538. 1925.—Commenting on a recent paper by Klöck (see Bot. Absts. 14, Entry 7087), the author states his belief that weather conditions are more effective than the “Polyeder” disease (Chlamydozoa) in controlling moth epidemics. The fact that small isolated stands in an infested region often escape injury points to the desirability of organizing managed forests in such a way as to avoid extensive pure, even-aged stands.—*W. N. Sparhawk*.

1604. RYLE, G. B. The conifer spinning mite or red spider, *Paratetranychus* (*Oligonychus*) *ununguis* Jacobi. Quart. Jour. Forest. 19: 31-39. Fig. 1-7. 1925.—This deals with the results of observations on the biology of *Paratetranychus ununguis* Jac., which recently has been found infesting certain coniferous trees in Britain, chiefly on Sitka spruce. The structure, life history, relations to the forest, and control measures are discussed. A diary of field and laboratory observations and notes on artificial infestation experiments are given.—*P. S. Spokes*.

1605. SAARI, EINO. Kotitarvepuun kulutus maaseudulla Turun ja Porin läänissä. [Domestic consumption of wood in the country in the Province of Turku-Pori.] (German summary.) Communicationes Inst. Quaest. Forest. Finlandiae 5. 1-190. 25 fig. 1923.—The present inquiry is the first attempt at treating the problem of wood consumption in Finland on a scientific basis. The author endeavors to arrive at results more exact than any before by new methods, chiefly those of mathematical statistics. By means of correlation calculations the relation is shown between the amount of wood consumed in various domestic uses and as a whole, and the size of the farms. The domestic consumption per capita in the province under consideration, which is comparatively well situated from both the economic and the climatic points of view, being in the extreme southwest of Finland, is  $5.353 \pm 0.152$  cu. m.—Wood consumption has been calculated per farm, per ha. of field under tillage, and per head of population.—*Y. Ilvessalo*.

1606. SCHAEFFER, A. Prophéties forestières. [Forest prophecies.] Bull. Trimest. Soc. Forest. France Comté et des Provinces de l'Est 16: 61-63. 1925.—Of various predictions made years ago, regarding forest utilization and development, some have and some have not come true.—*J. Kittredge, Jr.*

1607. SCHAEFFER, A. [Translated by WOOLSEY, T. S., JR.] Development of [French] management methods from 1912 to 1922. Jour. Forest. 20: 883-887. 1922.—Since 1912, and especially because of the timber requirements of the war, the need of transforming coppice to high forest has become very apparent in France. New methods of cutting coppice with standards, with frequent returns to the same place and accumulation of a large reserve in standards, obtain abundant timber more quickly than the old methods of conversion to regular high forest. Formulae are given for preventing an over-cut of standards and for enriching the reserve.—*Philip C. Wakeley*.

1608. SCHENCK, C. A. Forestry in Germany since 1914. Jour. Forest. 20: 770-775. 1922.



Despite the great demand for wood, the cut increased little, if any, above the possible sustained yield. Forest schools are combining from economic necessity. Utilization is still characterized by a minimum of waste, due in part to the excellent forest roads. Conservative silviculture with natural regeneration is paramount; "Dauerwald" is the latest fad. German-grown Douglas fir logs are on the market, and American red oak and white pine are doing well. As there are no wild currants the pine is not injured seriously by blister rust. Forest finance as a branch of science is dead. Saxony's spruce forests have shown the fallacy of managing forests on short rotations based solely on financial considerations.—*Philip C. Wakeley.*

1609. SCHLICH, W. **Clear cutting or shelterwood.** Quart. Jour. Forest. 19: 28-30. 1925. The results of further investigations on the unhealthy growth of spruce woods in Saxony carried out by Wiedemann are discussed and a full abstract of "Fichtenwachstum und Humuszustand" published by the Biologische Reichsanstalt is given. The stagnation of growth is due to insufficient moisture during the growing season and to unfavorable decomposition of humus. Schlich adheres to the general conclusions outlined in his previous article on the subject. (See Bot. Absts. 14, Entry 2515.)—*P. S. Spokes.*

1610. SCHMIDT. **Über neue Untersuchungen zum Kohlensäure problem.** [Recent researches on the carbon dioxide problem.] Zeitschr. Forst- u. Jagdw. 55: 534-542. 1923.—The results of previous investigations are briefly reviewed, specifically the question of the relation between CO<sub>2</sub> concentration in the atmosphere and the yield of wood. The author made 5 tests with oats in 1922. In the open, he got the maximum yield at normal CO<sub>2</sub> concentration, except in the fall (42% of summer light) when the optimum concentration was found to be 0.05%. In the greenhouse under 50% and 25% of full light, the optimum concentrations were 1.0% and 5.0%, respectively. As long as the experimental plants received full light, they showed themselves well adapted to the ordinary atmospheric CO<sub>2</sub> content. To get pronounced increases in yield, however, it is necessary to produce CO<sub>2</sub> concentrations that are practically impossible to duplicate in the forest.—*J. Roeser.*

1611. SCHREIBER, M. **Ueber "Schutz- Füll- und Treibholz."** [Auxiliary species in plantations.] Wiener Allg. Forst- u. Jagdzeitg. 43: 115-117. 1925.—The article was inspired by a question in the above named journal concerning the value of *Genista germanica*, *Spartium scoparium*, and birch as a protecting growth in plantations of spruce. The author discusses the use of these species, particularly birch. It does not protect the soil well, its leaf fall is not considerable, and it fails to improve soil conditions materially. Furthermore, the roots are shallow and it is a heavy user of water and tends to dry out the surface soil. The cultivation of *Spartium scoparium* in spruce plantations is looked upon more favorably, but use of broom (*Genista germanica*) is not believed to be practicable.—*F. S. Baker.*

1612. SEDLACZEK, WALTHER. **Studien an Fangbäumen zur Bekämpfung der Borken- und Rüsselkäfer.** [Studies of trap-trees for combatting bark beetles and weevils.] Centralbl. Gesam. Forstw. 48: 185-207. 1922.—Details are given of the results obtained with 44 spruce trap-trees, some of which were girdled and some felled. For *Tomicus typographus*, the most important spruce bark beetle in the Steiermark region of Austria, trap-trees are most effective if felled between March and May. The optimum season for felling the trees varies somewhat for several other beetles.—*W. N. Sparhawk.*

1613. SEITNER, M. [Rev. of: DECOPET, M. **Le hanneton—biologie, apparition, destruction.** (The May beetle.) 123 p. Payot & Cie: Geneva, 1920.] Centralbl. Gesam. Forstw. 47: 302-305. *Illus.* 1921.—This is a valuable monograph on an important forest insect. The author's conclusion that the periodic appearance of the beetle is not influenced by climatic conditions is in direct contradiction to Zweigelt's observations, and is open to question. (See also Bot. Absts. 12, Entry 1703.)—*W. N. Sparhawk.*

1614. SEITNER, [M.] [Rev. of: RHUMBLER, L., UND OTTO NÜSSLIN. **Forstinsektenkunde.** (Forest insects.) 3rd ed. xvi + 568 p. 457 fig. Paul Parey: Berlin, 1922 (see Bot. Absts. 12, Entry 5864).] Centralbl. Gesam. Forstw. 48: 330-332. 1922.—The reviewer considers this a standard text-book for forest schools. He points out 2 corrections: *Cecidomyia strobi* Winn. does not injure spruce seed, while *Megastigmus strobilobius* Ratz. occurs only in spruce, never in fir seed.—*W. N. Sparhawk.*

1615. SEN, JATINDRA NATH, AND TARAK PRADSAD GHOSE. **Soil conditions under sal.**

Indian Forest. 51: 242-252. 1 fig. 1925.—An easy and practical method of extracting gases from the soil for purposes of analysis is described. The results indicate that the amount of gas varies with the season, CO<sub>2</sub> being higher in the rainy period. Cleared soils had a higher percentage of CO<sub>2</sub> than those with a leaf cover. The amount of nitric nitrogen in the bare soil rose from July to December, while it decreased in covered soil.—*E. N. Munns.*

1616. SEYDEL, G. VON. Erfahrungen mit ausländischen Forstgehölzen in der Niederlausitz. [Experiences with exotic forest trees in Niederlausitz.] Mitteil. Deutsch. Dendrol. Ges. 28: 284-288. 1919.—A review is given of the behavior of several species of *Betula*, *Larix*, and *Pinus*. Seed obtained from abroad are often unreliable as to name, therefore it is better to obtain seed of exotic species from trees which have been grown in Germany.—*J. C. Th. Uphof.*

1617. SNYDER, THOMAS E. Tests of methods of protecting woods against termites or white ants. A progress report. U. S. Dept. Agric. Dept. Bull. 1231. 1-16. Pl. 1-2, fig. 1-8. 1924. With the growing scarcity and higher costs of wood, preservative methods of treatment are becoming essential. The most effective chemical for timber in contact with the ground was coal-tar creosote. Impregnation methods by the pressure or "open tank" methods were most effective, while brushing with several coats of coal-tar creosote will add several years to the life of the wood. For timber not to be used in contact with the ground, such as for interior woodwork, furniture, cabinet woods, etc., impregnation with zinc chlorid, bichlorid of mercury, sodium fluorid, or chlorinated naphthalene is effective; the woods can be painted after such treatments. Another protective method is to treat the hidden, cheaper cores of furniture, cabinet woods, etc., with preservatives during manufacture and then to overlay them with veneers of termite-resistant woods. Effective poisons to be added to wood-pulp products during manufacture are crude carbolic acid and coal-tar creosote. Data are also included on the relative resistance of untreated native and exotic woods to attack by termites.—*Author.*

1618. SNYDER, THOMAS E., AND JAMES ZETEK. Damage by termites in the Canal Zone and Panama and how to prevent it. U. S. Dept. Agric. Dept. Bull. 1232. 1-25. Pl. 1-10, fig. 1. 1924.—Additional original data are presented on the habits of Panama termites, their damage and control. Especial attention is given to (1) damage to lead-sheathed cables in locks of the Panama Canal and to telephone and lighting equipment at these locks; and (2) the possibility of termites acting as mechanical carriers of the nematode, *Aphelenchus cocophilus* Cobb, which causes "red-ring" disease of coconut palms. Under control, where large numbers of mounds occur on potential agricultural land, clearing by use of steam shovels, dynamite and caterpillar tractors, followed by poisoning the soil, is recommended. Data on rainfall and 2 maps of the region are included.—*T. E. Snyder.*

1619. SØRTHUS, K. Beitebruk og skogbruk. [Grazing and forestry.] Tidsskr. Skogbruk 33: 153-169. 1925.—An analysis of costs and profits in grazing shows that intensive grazing management, which includes cultivating the best lands, will liberate large areas for true forestry use and at the same time raise production in grazing. The worst damage from forest grazing is the injury to the small seedlings, while the most conspicuous damage is the barking of stems and chewing of shoots. The choice of lands for grazing is discussed.—*W. H. Meyer.*

1620. TIREMAN, H., ET AL. Administration report of the Forest Department of the Madras Presidency for the year ending 31st March, 1924. Vol. 1. 4 + 25 + 130 p. Vol. 2. 191 p. Madras, 1925.—The area of forests decreased to 18,956 sq. miles. Some new working plans were completed. Early burning was done on 3,855 sq. miles and protection was attempted on 5,811 sq. miles of which 5.5% burned over. The outturn of timber was 99,250 tons, of which 26,260 were by departmental agency. Satisfactory progress was made in regeneration of cutting areas and some teak was planted. The area of forest under panchayat management rose to 853 sq. miles.—*S. B. Show.*

1621. TREVOR, C. G. The frost of 1925 in the sal forests of the United Provinces. Indian Forest. 51: 253-254. 1925.—A shelterwood system is necessary to protect young sal (*Shorea robusta*) from frost. Damage from the overwood can be eliminated by cutting it after the young trees get a good start.—*E. N. Munns.*

1622. TSCHERMAK, L. Der Urwald und seine Ueberführung in Wirtschaftswald. [The virgin forest and its transformation into a managed forest.] Wiener Allg. Forest- u. Jagdzeitg.



43: 55-57. 1925.—The forests of the Balkan peninsula are discussed. The frequently repeated assertion that a virgin forest is a mixed forest like that resulting from the selection system of management is discussed and numerous exceptions are noted. The extent of virgin forest now left on the earth is roughly described. The usual methods of cutting in the virgin stands of the Balkans are severely criticised, for even where they are intended to be in accord with forestry principles they are usually far too heavy. There is a strong tendency to reduce the time for transformation to a minimum. Windfall, insect attacks, and poor reproduction are some of the results. A selection or a shelterwood system is advocated.—*F. S. Baker.*

1623. TSCHERMAK, [LEO]. *Aus der Urwaldpraxis.* [Treatment of virgin forests.] [Rev. of: FRÖHLICH, JUL. *Aus der Urwaldpraxis.* Wiener Allg. Forst- u. Jagdzeitg. 40: 226-227, 232-233, 238-239. 1922. (see Bot. Absts. 13, Entry 4943.)] Centralbl. Gesam. Forstw. 48: 312-319. 1922.—The reviewer pays especial attention to the need for providing adequate permanent transportation facilities in the virgin forests of Central Europe, and also in the more remote mountain forests that have long been under management, in order to make economically feasible their proper silvicultural treatment. Either clear cutting or shelterwood cutting of large continuous areas in any one year should be avoided.—*W. N. Sparhawk.*

1624. VIGERUST, A. *Kubikk- og tilvekstmasse for smådimensjoner.* [Volume and increment of small dimensions.] Tidsskr. Skogbruk 33: 337-343. 1925.—In ordinary timber estimating, the small sizes are not tallied. Tables are given for volume and increment of the smaller trees in terms of percentage of the lowest class tallied. The figures are based on the results of the State forest survey.—*W. H. Meyer.*

1625. VILLAR, JACOBO ARIAS. *Sobre elección de especies forestales. Las Sequoias.* [The choice of forest trees. Sequoias.] España Forest. 11: 75-77. 1925.—The writer advises against recent projects for planting *Sequoia sempervirens* or *S. gigantea* in northwestern Spain. Judging from experience with trees planted in parks, these species are excellent for ornamental purposes on favorable sites, but give no promise of making good timber trees.—*W. N. Sparhawk.*

1626. WICHMANN, HEINRICH E. *Die Bekämpfung des Pissodes pini.* [Combatting *P. pini.*] Centralbl. Gesam. Forstw. 48: 207-208. 1922.—*Pissodes pini* frequently breeds in the lower part of the stem of *Pinus silvestris*, usually in young trees 10-15 cm. in diameter at the base, the tops of which have been broken off by snow or wind. The number of beetles can be greatly reduced by breaking the tops from trap-trees about the end of February, with another series in May, and pulling and burning the stumps about 4 months later.—*W. N. Sparhawk.*

1627. WICHMANN, HEINRICH E. *Ueber Anthonomus varians Payk.* [Notes on *Anthonomus varians.*] Centralbl. Gesam. Forstw. 48: 10-13. 1922.—Contrary to the findings of Lindemann, that this weevil seriously injures the leaders of *Pinus silvestris*, the author's observations indicate that the larvae feed upon the pollen, and the beetles upon the foliage of *P. silvestris* and *P. montana*, but that little harm is done in either case.—*W. N. Sparhawk.*

1628. WIMMER, EMIL. *Die Lehre vom Forstschutz.* [The science of forest protection.] (8th revised ed. of VON FÜRST, HERMANN, UND KAUSCHINGER. *Die Lehre vom Forstschutz.*) x + 304 p. 85 fig. Paul Parey: Berlin, 1924.—Protection against climatic influences, including fire, is treated in 55 pages; protection against unfavorable soil conditions in 12 pages; and the rest of the book deals with protection against biotic factors, especially fungi (29 p.) and insects (153 p.).—*W. N. Sparhawk.*

1629. WODITSCHKA. *Der Waldhonigtau.* [Forest honeydew.] Wiener Allg. Forst- u. Jagdzeitg. 43: 45. 1925.—The production of honeydew by leaves of forest trees under certain climatic conditions is widely believed in. In every case so far examined—aspens, beech, and fir are mentioned—an insect was responsible for the honeydew. On aspen and beech the nymphs of *Cicada* (*Bythoscopus*) *lanio*, and on fir *Aphis piceae* were responsible. (See also this issue, Entry 1507.)—*F. S. Baker.*

1630. WOODWARD, K. W. *One seed tree.* Jour. Forest. 20: 828. 1922.—The reproduction from an isolated *Pinus resinosa* 35 years old and 45 feet high, near Durham, New Hampshire, shows "that satisfactory natural regeneration from scattered seed trees can only be expected for a distance not greater than their height and then only on the leeward side."—*Philip C. Wakeley.*

1631. WREDE, CARL VON. *Die Bestandesklimatologie und ihr Einfluss auf die Biologie*

der Verjüngung unter Schirm und in der Gruppe. [Climatology of the stand and its influence on the biology of reproduction under shelterwood and in groups.] Forstwiss. Centralbl. 47: 441-451, 491-505, 570-582. Fig. 1-2. 1925.—A comparative study was made of the various climatic factors in a mixed stand of spruce, fir, pine, and beech, cut by the shelterwood method, and in small clearings (13-14 m. diameter) in the same stand. Air temperature, humidity, wind movement, and evaporation (soil moisture) were measured. In general, the group method of cutting is most favorable for reproduction in regions where water economy is the governing factor. More precipitation reaches the ground than under shelterwood, the air and soil temperatures are lower and the range in temperature is less. There is also less air movement, less evaporation, and less damage from late frosts.—In more humid regions, where heat economy is the governing factor, shelterwood cutting is to be preferred, for the higher temperatures and greater evaporation result in faster growth, and there is less danger of the formation of raw humus.—For regenerating extensive stands by the group method, Seeholzer's combined Bavarian method, which resembles Wagner's "Blendersaumschlag," should be used.—*W. N. Sparhawk.*

1632. WYMAN, LENTHALL. Results from sample plots in southern pines experiments. Jour. Forest 20: 780-787. 1922.—The author describes the results of thinnings and the effect of fire and of grazing by horses, cattle, and hogs on 5 series of permanent sample plots laid out in 1915 on the lands of the Urania Lumber Co. (Louisiana). Hogs destroyed all longleaf pine young growth, while moderate winter fires stunted the longleaf seedlings seriously and after they had reached a height of 6 inches, killed as many as  $\frac{1}{2}$  at each fire. Without grazing, complete fire protection is necessary because of the accumulated inflammable material. A needle disease of longleaf pine killed some seedlings and rendered the rest less fire resistant.—*Philip C. Wakeley.*

1633. XYLOS. Les arbres et les bois dans l'antiquité orientale. [Ancient oriental records of trees and wood.] Bull. Soc. Centrale Forest. Belgique 31: 335-341. 1924.—The various Biblical references to trees and wood are discussed.—*H. T. Gisborne.*

1634. ZIEGLER, E. A. Classification of forest school graduates as an index of the progress of forestry. Jour. Forest. 20: 876-882. 1922.—Analysis of the present employment of graduates from 11 forest schools leads the author to believe that less than  $\frac{1}{3}$  of the trained foresters in the U. S. A. are engaged in timber growing, that private forestry is practically non-existent and what forestry the country has is mainly government forestry, and that only rapid extension of government forestry can mitigate the coming timber shortage.—*Philip C. Wakeley.*

## GENETICS

ORLAND E. WHITE, *Editor*

(See also in this issue Entries 1337, 1365, 1379, 1413, 1431, 1436, 1437, 1441, 1456, 1465, 1726, 1731, 1770, 1780, 1814, 1818, 1819, 1869, 1884, 1919, 1934, 1990, 2011)

1635. ASDELL, S. A., AND F. A. E. CREW. The inheritance of horns in the goat. Jour. Genetics 15: 367-373. 1925.—A study of the Herd Book of the British Goat Society and of privately kept records indicates that the polled and horned conditions in the goat constitute a Mendelian pair of characters, polled being dominant. In the matter of horn inheritance the goat apparently resembles the ox rather than the sheep.—*H. C. McPhee.*

1636. BALLEGO, J. B. Die Zucht neuer Dahlien. [Breeding new dahlias.] Möllers Deutsch. Gärtnerzeitg. 39: 289-290. 1924.—A number of superior dahlias originated by the author are briefly mentioned.—*Richard Wellington.*

1637. BARNES, WILL C. The inventive genius at work. Field Illus. 354: 11-13. 1 fig. 1925.—The article is a popular account of Alexander Graham Bell's genetic experiments with multi-nippled, twin-bearing sheep. Material has been freely used from Bell's article in Jour. Heredity 14: 99-111. 1923.—*J. L. Collins.*

1638. BELLING, JOHN. The origin of chromosomal mutations in *Uvularia*. Jour. Genetics 15: 245-265. Fig. 1-11. 1925.—Abnormal chromosome behavior presumably due to low temperatures was found in *Uvularia*. Non-disjunction, non-conjunction, doubling of the chromosome number and fracture of the chromosomes was observed. The relation between abnormal chromosome behavior and genetics is discussed.—*K. Sax.*



1639. BLARINGHEM, L. **Observations nouvelles sur la xénie chez le blé.** [New observations on xenia in wheat.] *Compt. Rend. Acad. Sci. Paris* 180: 389-391. 1925.—In crossing *Triticums* interspecifically the maximum grains per head are secured using pollen only from 1 head. It has been found possible to identify the form, size and weight of the hybrid endosperms resulting from crossing interspecific *Triticums*. These endosperms are not reciprocally identical as are those of intervarietal *Triticum* crosses. The cross *T. vulgare* × *T. turgidum* yielded grains averaging around 20 mg., while the contrary cross produced grains of more than double this weight. Similar results were secured from the reciprocal crosses between *T. dicoccoides* × *T. monodurum* and between *T. vulgare* × *T. monodurum*. Shapes of grains were likewise divergent in reciprocal crosses. Certain minor differences, such as contour and surface markings, are associated with different parent species and with the way the parents enter into the cross. Lack of equilibrium between endosperm and ovary explains premature mortality of certain combinations.—*L. R. Waldron*.

1640. BLARINGHEM, L. **Production de nouveaux hybrides entre les espèces sauvages de *Triticum* (*monococcum* L., *dicoccoides* Körn.) et les principaux blés cultivés. Analyse de leurs affinités.** [The production of new hybrids between wild species of *Triticum* (*monococcum*, *dicoccoides*) and the chief cultivated wheats. An analysis of their affinities.] *Compt. Rend. Acad. Sci. Paris* 180: 218-220. 1925.—*Triticum monodurum*, derived from crossing *T. monococcum* and *T. durum*, after 6 generations shows remarkable vigor and good quality of grain but has weak straw. With this new wheat, possibilities arise from other successful diverse crosses; 32 such are listed, secured in 1924, producing 455 grains. *T. monococcum* or *T. monodurum* entered into 14 of them. One cross is listed between *T. spelta* and *T. monococcum*. *T. dicoccoides* is considered to have closer affinities with cultivated wheat than *T. monococcum*.—*L. R. Waldron*.

1641. BLARINGHEM, L. **Sur un nouvel hybride, fertile, de blé poulard (*Triticum turgidum* L.) et de seigle (*Secale cereale* L.).** [A new fertile hybrid between poulard wheat (*Triticum turgidum* L.) and rye (*Secale cereale* L.).] *Bull. Soc. Bot. France* 71: 1158-1168. Pl. 1-11. 1924.—A new fertile hybrid of poulard wheat (*Triticum turgidum* L.) and rye (*Secale cereale* L.) is described. A brief summary of the literature on wheat-rye hybrids is followed by a summary of certain characteristics of hybrids of poulard wheat fertilized by rye in 1921 and 1922. The variety of poulard chosen, "Bourdon," is highly regarded, a rank grower, very late and susceptible to rust. The pollen was taken from a Schlandstedt rye selection which, however, was heterozygous for color. In 1921, 350 worked flowers gave 3 seed; in 1922, 6 successes were obtained from 500 flowers; and in 1923 no grains were produced from 500 attempts. In all successful hybrids the grains differed materially from the maternal characters, notably in color and shape, resembling rye. Rye color and shape proved dominant. The statement is made that xenia is a common phenomenon in wheat hybrids. Crosses of rye on spelt and poulard were successful. The reciprocal crosses were successful in no case. Poulard-rye crosses gave markedly attenuated fertility in  $F_1$  and  $F_2$ . "False-hybrids" as described by Millardet are said to occur.—*O. O. Churchill*.

1642. BOEDIJN, K. **Die Chromosomen von *Oenothera Lamarckiana* mut. *simplex*.** [The chromosomes of *Oenothera Lamarckiana* mut. *simplex*.] *Zeitschr. Indukt. Abstamm- u. Vererb.* 24: 71-76. Plate 1. 1921.—Taxonomic descriptions and chromosome numbers are given for *Oenothera Lamarckiana* mut. *simplex*, and the mutants derived in turn from it. Those having 14 chromosomes are *O. simplex*, *O. simplex nanella*, *O. simplex linearis*, *O. simplex deserens*, and *O. secunda*. Fifteen chromosomes are found in the cells of *O. simplex lata* and *O. secunda lata*. *O. simplex semigigas* and *O. (blandina* × *simplex*) *semigigas* possess 21 chromosomes. One plant in a culture of *O. simplex nanella* turned out to have 28 chromosomes, although externally it was a typical dwarf. Unfortunately, it failed to flower. From this work it appears that although *O. Lamarckiana* mut. *simplex* lacks the *velutina* gamete, it nevertheless possesses the same mutability as *O. Lamarckiana*.—*Ralph E. Cleland*.

1643. BOHLMANN, E. **Hybridisation in der Orchideenzucht.** *Gartenschönheit* 6: 6-8. *Illus.* 1925.—A brief historical sketch is given of the hybridization of orchids and of the method of recording seedlings used by the Royal Horticultural Society of London. About 17,000 wild species are now recognized and approximately 100,000 artificially raised

hybrids. Attention is called to the great variability of plants in the Orchidaceae and the readiness with which species and genera cross. The present aim of the breeder is to produce well-formed and beautifully colored flowers of long duration. The number of natural genera has been increased through the crossing of 2 genera, as for example *Laeliocattleya*, *Brassicattleya*, *Sophrocattleya* and *Sophrolaelia*. A few crosses are noted, one of which was produced by crossing 3 genera and 6 species. Illustrations, colored and uncolored, are given of a few types.—*Richard Wellington*.

1644. BRIDGES, CALVIN B. Sex in relation to chromosomes and genes. Amer. Nat. 59: 127-137. 1925—The author has found a series of sex-types in *Drosophila*, each the result of a particular combination of chromosomes and derived mainly from triploid females. The conception of "genic balance" previously used to interpret mutant characters is now applied to sex characters. The addition of an extra set of autosomes to an ordinary ♀ group ( $2n$ ) gives intersexes, showing that autosomal genes as a whole have a ♂-determining tendency. The X-chromosome has a net ♀-determining tendency because the addition of X to an ordinary ♂ group gives a ♀. Female potency of X is greater than ♂ potency of a set of autosomes because  $2X + 2A$  (ordinary ♀ group) gives a ♀;  $3X + 2A$  gives a sterile super-♀;  $X + 3A$  gives a sterile super-♂. The small, dot-like, 4th chromosome, like X, has a net ♀ tendency, and by varying the number of 4th chromosomes it is possible to have a "fringe of minor sex-types about each of the major types." The  $4X + 4A$  individuals are ♀♀ and indistinguishable from triploids. The view is developed that sex expression depends on the ratio of genes with ♀ tendency to those with ♂ tendency. This is consistent with facts outlined above and especially with the fact that  $4n$ ,  $3n$  and  $2n$  individuals are all ♀♀. This leads to the expectation that haploid individuals (unknown thus far) would be ♀. It is assumed that the sex-determining mechanism is different in *Drosophila* from that in the bee, etc., where the haploid is ♂. Goldschmidt's work on the gypsy moth is reviewed with the conclusion that the ratio, instead of the algebraic mode of expression, fits the facts better. The ratio view of genic balance is also confirmed by work of geneticists on mosses and by the fact that in triploid and tetraploid monoecious plants sex relations agree with diploid, as is also the case in the haploid *Datura*.—*C. W. Metz*.

1645. BURKILL, I. H. *Stenomeris* in the Malay Peninsula. Gard. Bull. Straits Settlements 3: 289-290. 1924—A sterile plant agreeing in foliage with H. N. Ridley's description of *Stenomeris borneensis* Oliv., was found in March 1922 in the Bukit Raja forest. Other specimens were located later but all were sterile so that absolute identification was impossible. The plants bear on underground stems slightly starchy tubers 2-3 inches in length, composed of swollen stem tissue which gives rise laterally to new stems. Since this manner of growth is apparently normal the tubers may be considered resting branches.—*Mary Ellen Peck*.

1646. BURKILL, I. H. Two hybrid trees of *Hevea brasiliensis* × *H. confusa*. Gard. Bull. Straits Settlements 3: 257-258. 1924.—Two hybrid trees of *Hevea brasiliensis* ♂ × *H. confusa* ♀ were found in the Singapore Botanic Garden and grown for comparison with their parents. *H. confusa* is a very inferior rubber producer. Cross-fertilization may occur when the 2 species are as much as 100 yards apart, so that the presence of any specimens of *H. confusa* near a rubber plantation would result in the production of hybrid seed. The 2 hybrids differed from each other in bark color and leaf shape. Both resembled *H. confusa* as to flower shape and *H. brasiliensis* as to anthers. Both had the white latex of *H. brasiliensis* but the meagre amount characteristic of *H. confusa*.—*Mary Ellen Peck*.

1647. CARNE, WALTER M., AND E. J. LIMBOURN. The occurrence of certain natural cross-breeds in oats and barley at the State Experimental Farm, Merridin, Western Australia. Jour. and Proc. Roy. Soc. Western Australia 10: 69-73. 1924.—The crosses found were Algerian × Skinless Oats, Skinless × Common Barley, and Skinless × Two Rowed Barley. Hybrid wheats are also mentioned.—*Wm. Randolph Taylor*.

1648. CHODAT, R. La chiasmotypie et la cinese de maturation dans l'*Allium ursinum*. [The chiasmotypy and maturation mitosis in *Allium ursinum*.] Bull. Soc. Bot. Genève 17: 1-30. 1925.—In the reduction division of the spore mother cells of *Allium ursinum* the chromosomes pass through the leptotene stage to diakinesis as usually described. The chromo-



somes unite at the ends telosynaptically, become shorter and thicker. If the ends are free the paired chromosomes appear coiled or twisted but only glide over each other without fusion until reaching the metaphase. In the metaphase the bivalent chromosomes (myxochromosomes) appear in rhombic form. A vertical and horizontal slit in the fused ends of the chromosomes gives 4 globules, the staurosomes, improperly called tetrads. These staurosomes are the essential parts of the bivalent chromosomes involved in the end crossing of the chromosomes and their formation accomplishes a chiasmatic fusion in the metaphase. By the division and longitudinal cleavage of the half-staurosomes (the split ends of the bivalent chromosomes after crossing over) there appear univalent chromosomes belonging to 4 classes, 1 right and 1 left for each pair.—*W. H. Emig.*

1649. CLELAND, RALPH E. Chromosome behavior during meiosis in the pollen mother cells of certain *Oenotheras*. *Amer. Nat.* 59: 475-479. *Fig. 1-8.* 1925.—A brief account of chromosome behavior in the pollen mother cells is presented in the case of the following species: *O. Lamarckiana*, *O. rubrinervis*, *O. rubricalyx*, *O. blandina*, and *O. deserens*. In late prophase in *O. Lamarckiana*, 12 of the 14 univalent chromosomes are attached end to end to form a large closed circle. The other 2 are paired. In *O. rubrinervis* there is a circle of 6, plus 4 pairs; in *O. rubricalyx* a circle of 8 with 3 pairs; and in *O. blandina* and *O. deserens* there are no circles, but all of the chromosomes are paired in the manner characteristic of most plants during diakinesis. In the heterotypic metaphase, circles of chromosomes remain intact and become spread in a generally horizontal fashion across the spindle, the fibers being so attached to the chromosomes that adjacent chromosomes are carried to opposite poles. Just before the chromosomes are separated, therefore, a striking zigzag appearance is imparted to the circle. The number of species of *Oenothera* so far studied by the author totals 11. Of these, 2 show entire pairing of the chromosomes in "diakinesis," 1 has a circle of 4 chromosomes and 5 pairs, 1 a circle of 5 and 5 pairs, 1 a circle of 6 and 4 pairs, 1 a circle of 8 and 3 pairs, 2 a circle of 12 and 1 pair, and 3 have no paired chromosomes at all. The zigzag appearance in heterotypic metaphase is observed in all species which possess large circles. A discussion of the possible relation of these facts to the problems of linkage, crossing-over and the origin of "mutants" is promised in a subsequent paper.—*Author.*

1650. COFFMAN, F. A., AND T. R. STANTON. Variation in the Kherson Oat at Akron, Colorado. *Jour. Agric. Res.* 30: 1063-1082. 4 pl., 1 fig. 1925.—The Kherson variety, considered identical with Sixty-Day together with the pure-line selections developed from it, constitute a very important agronomic group and occupied about 14% of the oat acreage in the U. S. A. in 1919. The variability of the variety is indicated by the fact that many selections have been made from it. Variability in the variety as it existed at Akron, Colorado, was studied in 5 characters, namely, spikelet disarticulation or separation of the lower floret or kernel of the spikelet from its base, floret disjunction or the separation of the florets or kernels of the spikelet from one another, basal hairs or hairs on the callus, awns, and lemma color. Spikelet disarticulation was observed to result either by semiabscission or by fracture. Most strains showed the more or less rough and pointed floret base resulting from fracture, which is characteristic of *Avena sativa* varieties. Disarticulation by semiabscission, resulting in the presence of a slight basal cavity, occurred in some instances, but was not always constant in breeding. Floret disjunction was predominantly by disarticulation, as in *Avena sativa*, and was probably homozygous in breeding. The very small percentage of kernels showing floret disjunction, either by basifracture, as in *A. sterilis*, or by heterofracture, an intermediate type, were attributed to chance variations. Basal hairs appeared exceedingly complex, necessitating further study to determine their true genetic nature. No definite relation was observed between presence of awns and kernel color. The yellow color of the Kherson strain used did not carry an inhibitor for awns, all types of awns being found on yellow kernels. Yellow-kerneled strains also were isolated, which from the evidence were homozygous for certain awn types as well as for complete absence of awns. Several factors seem to be concerned in the production of awns. Apparently but 2 factors for lemma color exist in the variety, 1 for yellow and 1 for white. Some strains evidently were heterozygous for lemma color, but homozygous yellow predominated. Some white strains were observed but they were less numerous than the yellow ones.—*F. A. Coffman.*

1651. COLIN, H., ET Y. TROUARD-RIOLLE. Le croisement orge noire à barbes lisses  $\times$  orge blanche à barbes rugueuses (orge Albert). [The cross between smooth awned black barley and rough awned white (Albert) barley.] Compt. Rend. Acad. Sci. Paris 180: 1129-1131. 1925.—In this cross dominance in the 2 characters, rough and black, was not constant for all  $F_1$  plants but varied to smooth and in color to gray mixed and to whitish, especially in the awns. Later segregations carried out to the  $F_4$  generation were very complicated, making it impossible for the authors to suggest any factor hypothesis, but it is claimed that their results follow the Mendelian law in a general way. From the  $F_2$  parent black smooth, 9 forms were obtained in the  $F_3$ —black, gray, white and rough, smooth-rough, smooth, in their various combinations. A segregate pure for smoothness seemed difficult to obtain as the awns, glumes and caryopsis coats showed a tendency to roughness.—*L. R. Waldron.*

1652. COLLINS, J. L. Inbreeding and crossbreeding in *Crepis capillaris* (L.) Wallr. Univ. California Publ. Agric. Sci. 2: 205-216. 3 pl. 1920.—*Crepis capillaris* was collected from fields and grown in garden cultures for several years from constantly self-fertilized seed. A marked reduction in size of plants and in rapidity of growth and maturity was noted as inbreeding progressed. An immediate return to normal wild type condition followed crossing of the weakened inbred strains.—*Author.*

1653. COULTER, MERLE C. A distortion of the 3:1 ratio. Bot. Gaz. 79: 28-44. 1925.—A report is given of investigations of a race of maize of composition  $Cc$  which produced 10.85% of white grains instead of 25%. Tests of colored grains from such ears showed that some of the segregating progenies of the next generation repeated the aberrant ratios. The author suggests that a zygotic lethal linked with  $c$  and exhibiting about 18% of crossing-over with it existed in this race. Low white ratios are, therefore, due to segregation in a plant which was  $(CL_1)$  ( $cl_1$ ) in constitution; and high white ratios, about 33% white, were also obtained subsequently, *ex hypothesi*, through production of  $(CL_1)$  ( $cl_1$ ) plants. Also crosses of purple from low white with normal  $c$ -white subsequently gave high white ratios as was to be expected. Other requirements of the hypothesis were also fulfilled; but no physical evidence of the existence of the zygotic lethal was obtained, except that ears showing aberrant ratios bore fewer grains than those segregating normally. Preliminary evidence is presented for establishment of races of low-white differing genetically in cross over values between  $C$  and  $L_1$ . The author discusses the *modus operandi* of evolution by factor mutation.—*R. E. Clausen.*

1654. DANIEL, LUCIEN. Nouvelles recherches sur l'hérédité chez le topinambour greffé. [New researches on inheritance in the Jerusalem artichoke graft.] Compt. Rend. Acad. Sci. Paris 180: 1426-1428. Fig. 1-7. 1925.—The results from grafting varieties of artichokes (*Helianthus tuberosus*) are given. The seed from a grafted plant produced plants which resembled the stock. The case is considered an irrefutable example of the inheritance of acquired characteristics. The inheritance through tubers of varying shape was followed. The plants may be propagated either by the aerial or the subterranean tubers. Those propagated by the subterranean tubers of a grafted plant sometimes produce plants whose aerial tubers resemble those borne on the parent scion. Great variation was observed in all the tubers, and the plants produced from tubers of grafted plants always showed some variation from the type.—*Mary Ellen Peck.*

1655. DAVENPORT, CHARLES B. Chromosomes, endocrines and heredity. Sci. Monthly 20: 491-498. 1925.—The significance of the word "heredity" has increased from the primitive concept of inherited appearance to that of the chromosomes as the carriers of heritable genes. The structure of the chromosome, mutations in its constituent genes and variations in the number of whole chromosomes or fragments of them bear an apparent relation to variations in the organism. The resemblances between relatives and between identical twins are examples of degrees of chromosomal identity. The resemblance between unrelated victims of glandular diseases, cretins and mongoloids presents a problem which indicates that the functioning of the endocrine glands is also a controlling factor in the development of man and other animals. The 2 factors, chromosomes and glandular activity are not necessarily mutually exclusive. The glands are what the chromosomes make them,



though they are responsive in a large degree to the nervous system and through the nervous system to the environment. The physiology of development is a comparatively untouched field, the study of which may bring a broader point of view to the science of genetics.—*Mary Ellen Peck.*

1656. FANTHAM, H. B. **Heredity in man: its importance both biologically and educationally.** *South African Jour. Sci.* 21: 498–527. *Fig. 1–15.* 1924.—The article consists of a general discussion of heredity in man. The author considers inheritance in man to be so closely associated with environment that it cannot be regarded as an independent entity. He holds that any hereditary characteristic, with the possible exception of a mental or moral one, must be regarded as a reaction between the germ plasm and its environment. Since the study of heredity in man is hindered by the lack of direct breeding experiments, the present information on the human aspect of the science has been derived from analysis of records. From the existing data the author discusses the genetic behavior of some of the heritable characteristics in man. Under the head of physical dominant characters he places brachydactyly, polydactyly, syndactyly, premature grayness, white forelock and white rings of hair, baldness, piebaldness, Huntington's chorea and eye color. Under physical recessive characters he describes the inheritance of albinism, red hair and various abilities such as musical talent. Under characters which appear to be sex-linked, he describes the inheritance of color blindness and haemophilia in the ♂ sex, night blindness and a tendency toward multiple births in the ♀ and short sight which seems to be inherited from either parent by the child of the opposite sex. He considers height, expressed either as tallness or shortness, to be a character often resulting from selective mating. The inheritance of feeble-mindedness, with its resultant tendency toward crime, and temperament which also seems to be determined by the germ plasm, is described. The author discusses the theory of the chromosome as the physical basis of heredity and gives examples of its proof from the observations which have been made relating to the determination of sex. The article concludes with a discussion of eugenics in its social application. The author places emphasis on the improvement of the individual as the only hope of human advancement. He points out that national decline is the result of racial deterioration. He gives as factors making against improvement, the deplorable birth rate among the unfit and wars which destroy the most fit. As factors making for the improvement of the race he suggests immigration exclusion laws, laws restricting the marriage of the unfit, the segregation of victims of hereditary defects and the education of public opinion. He discusses the fostering of the growth of a eugenic conscience as a step toward the future realization of a eugenic ideal.—*Mary Ellen Peck.*

1657. FINLAY, GERALD FONSTIN. **Recent developments in cattle breeding.** 62 p. *Illus.* Oliver and Boyd: Edinburgh, 1924.—This is a brief discussion of such subjects as inheritance, sex, fallacies in breeding and methods of improvement, and is intended primarily for use by practical cattle breeders.—*H. C. McPhee.*

1658. FRATEUR, J., ET JOS. FRATEUR. **La nature mendélienne du sexe étudiée par le rythme de la ségrégation mendélienne.** [The Mendelian nature of sex investigated by means of the rhythm of Mendelian segregation.] *Genetica* 7: 103–110. 1925.—The investigations reported were conducted with fowls. Eggs were collected individually and incubated so that the order of production of the characters in question was determined. The authors use the phrase, "rhythm of segregation," to denote the alternation of dominant and recessive members in the segregation series. The segregation series for the backcross of an  $F_1$  from rose  $\times$  single comb to single was compared with that of sex. From the similarity of the 2 series the authors conclude that the differences between the sexes is due to a single Mendelian factor, and that one sex is a unifactorial heterozygote, the other a homozygous recessive. The authors contend that each type of segregation exhibits a characteristic rhythm, and that the rhythm for a dihybrid differs from that for a monohybrid.—*R. E. Clausen.*

1659. GATES, R. RUGGLES. **Genetical investigations.** *Nature* 116: 297–298. 1925.—Reference is made to papers by K. SAX and C. B. DAVENPORT. "Genetics is destined to have a fundamental effect upon the interpretation of anthropologists."—*O. A. Stevens.*

1660. GEIER, M. **Zur Abstammung der Schlingrose "Crimson Rambler."** [The descend-

ants of the climbing rose "Crimson Rambler." Möllers *Deutsch. Gartenzeitg.* 40: 202-203. 1925.—The question as to the origin of the Crimson Rambler has not yet been solved.—*J. C. Th. Uphof.*

1661. GERBAULT, E. L. Une anomalie chez la violette. [An anomalous violet.] *Bull. Soc. Bot. France* 69: 536-539. 1922.—Concerning a violet found growing near Sarthe, and named according to M. Ambroise Gentil, *Viola permixta*, the question is raised whether this is correct. It appears to be a hybrid of *Viola hirta* L. and *Viola odorata* L. It is felt, however, that it may perhaps be considered as an "anomalie bauroletsyenne," a hybrid in which certain characters vary from year to year.—*Leslie R. Hawthorn.*

1662. GÜNTHER, E. Der Pflanzenzuchtbetrieb der Domäne Fürst Paul Eszterházy zu Eszterháza. [Plant breeding operations in the domains of Prince Paul Eszterházy of Eszterháza.] *Zeitschr. Pflanzenzücht.* 10: 129-142. *Fig. 1-3.* 1925.—A brief account of the climate and soil conditions of the district is given by way of introduction. In general the climate is so rigorous that attention is restricted for the most part to acclimated local varieties, rather than to the introduction of new ones. These local varieties exhibit great diversity and provide excellent material for improvement by selection. Brief details as to breeding operations and accomplishments are given for winter rape, grasses, alfalfa, flax, poppy, horse bean, fodder beets, maize, potatoes, winter rye, oats, and winter and spring wheats. Most complete details are given for alfalfa, for which special studies of pollination and seed setting have been made. The author believes that alfalfa is largely self-fertilized, but that tripping of the blossoms is necessary for pollination. Bees were found to be particularly active agents in the process. The article is devoted entirely to practical phases.—*R. E. Clausen.*

1663. GUYÉNOT, EMILE. L'hérédité. [Heredity.] *x + 463 p. 47 fig.* Librairie Octave Doin: Paris, 1924.—This work is one of a series of hand-books which form the Bibliothèque de Biologie Générale, Encyclopédie Scientifique. The material of this volume is divided into 4 general parts designated introductory, the laws of hybridization, the chromosome theory of heredity, Mendelian anomalies and problems of heredity. The chapters composing these parts deal in sequence with the continuity of living matter due to heredity, heredity and variation, disjunction of characters and gametic purity, independent segregation, factorial interpretation, the genes, gene activity, analyzing the inheritance, the chromosome explanation of segregation, proofs of the chromosome hypothesis through sex-linked inheritance and the association between factors, localization of the factors in chromosomes, objections to the chromosome theory, chromosome variability, the importance of the nucleus and the cytoplasm, the importance of the chromosome theory, some Mendelian anomalies such as lethals, alternative and unilateral inheritance in species crosses, heredity of sex, heredity in man and inherited defects, telegony, xenia, atavism, and Galton's laws. Appended are a bibliography, a subject and author index arranged alphabetically, and a subject index classified by chapters.—*Orland E. White.*

1664. HAGEDOORN, A. C. Soortvorming en eugenetica. [Variation and eugenics.] *Genetica* 6: 401-463. 1924.—Since a gene present in the hereditary make-up of an organism is not always a factor in its development, the "presence or absence" theory and the determinant conception of heredity should be abandoned. Crossing is the chief cause of variability. Mutation as a form of variation cannot be denied although it is practically impossible to prove. Wholly new quantities, anatomical, physiological and psychical, arise from crossing. An organism's potential variability may be measured by the number of its heterozygous genes and the potential variability of a group may be measured correspondingly by the number of heterozygous individuals it contains. A species is a group of organisms which tends automatically to reduce its total potential variability and become homozygous. When variability exists, a species can arise provided isolation follows. Heredity in man follows the same laws as in the lower organisms. The races of man (anthropological) may or may not be identical with species. The possibility of improving the inherited makeup of humanity lies more in the study of the natural groups and the causes of their inheritable aberrations than in the inheritance of these aberrations after they occur.—*Mary Ellen Peck.*

1665. HAGIWARA, TOKIO. Genetic studies of leaf characters in morning glories I. The complementary factors concerning the "Udu"-character. (In Japanese.) *Bot. Mag. Tôkyô*



38: (277)-(290). 3 fig. 1924.—Among the contracted varieties known by the general name "Udu" there are 3 strains, namely, "uduba-udu," dwarf-"udu," and semi-"udu."—In "uduba-udu" the leaves are amplexicaul. The strain is recessive to the normal.—In dwarf-"udu," though the leaves are normal, the internodes are short, the stem does not twine, and it is recessive to the normal strain.—In semi-"udu" the leaves appear to be intermediate between normal and amplexicaul. This also is recessive to the normal strain.—Hybridization between dwarf-"udu" and "uduba-udu" gives rise to reversionary normal plants. In the next generation, each of the latter segregates into normal: contracted in the ratio 9:7, which indicates that the factors concerning these two "udu"-strains are complementary. It must be noted that the contracted plants which are segregated out in  $F_2$  contain not only "uduba-udu" and dwarf-"udu," but also plants which are only 2-3 inches high, that is, one of the most dwarf of the morning glories.—S. I. (Courtesy Japanese Jour. Bot.)

1666. HAGIWARA, TOKIO. Inheritance of the fasciation in the Japanese morning glory. (In Japanese.) Jour. Sci. Agric. Soc. 355: 54-63. 1 fig. 1924.—The cross between morning glory with normal and that with fasciated stems has given in  $F_1$  normal plants, and in  $F_2$ , 94 normal to 7 fasciated. The author's conclusion is that the fasciation is due to the co-operation of the 2 recessive genes  $f'$  and  $p$ , the latter alone causing the so-called "kuziyaku" (peacock)-shaped leaf of the gardeners. The linkage relation between the gene  $f'$  and others was noticed.—S. I. (Courtesy Japanese Jour. Bot.)

1667. HÅKANSSON, ARTUR. Zur Zytologie der Gattung *Godetia*. [The cytology of the genus *Godetia*.] Hereditas 6: 257-274. 63 fig. 1925.—Reduction divisions in the pollen mother cells are described in *Godetia amoena* ( $x = 7$ ), *G. Whitneyi* ( $x = 7$ ), *G. Bottae* ( $x = 9$ ), *G. lepida* ( $x = 21$ ) and *G. amoena*  $\times$  *G. Whitneyi* ( $2x = 14$ ). Embryo sacs were also studied in the case of this hybrid. Fixations were made with Carnoy's and Zenker's fluids. Parasygnapsis appears to be the rule, rather than telosynapsis. The chromosomes are usually paired in diakinesis, forming rings, such as are seen in the case of paired chromosomes in *Oenothera*. In the hybrid, incomplete evidence from 1 plant indicates a general lack of pairing in diakinesis, with chromosomes attached in some cases by their ends. Lagging of chromosomes in the spindles, and irregularities in pollen grain development are also suggested. The genus lacks both the genetical and cytological peculiarities of *Oenothera*, but the examination of the hybrid *amoena*  $\times$  *Whitneyi* inclines the author to the opinion that the prevalence in *Oenothera* of unpaired chromosomes arranged end to end in diakinesis came about originally through hybridization.—Ralph E. Cleland.

1668. HAMPP, ET AL. Klima und Boden, die Grundlagen der Kartoffelzüchtung. [Climate and soil, the foundation of potato culture.] Beiträge Pflanzenzücht. 7: 55-64. 1924.—Intelligent selection and maintenance of the seed stock in a healthy condition is believed to be more important than the development of new varieties and strains. Climate is regarded as a very important factor in maintaining healthy stock. Soil comes next in importance followed by proper cultural practices. A light soil is thought to retard tuber degeneration but is not in all cases favorable to the production of high quality seed. A personal examination of different soils seemed to indicate that the best seed potato soils usually showed a pronounced acid reaction, while those favoring degeneration were neutral or alkaline. The production of heavy yields through liberal application of manures or mineral fertilizers is believed to induce degeneration. Varietal adaptation to climatic and soil conditions is regarded as important. Certain favorable and unfavorable seed producing localities in Bavaria are mentioned and reasons therefor given. The author believes that certain desirable strains showing a tendency to degeneration might be saved by growing them under more favorable conditions.—W. Stuart.

1669. HARTMANN, M. Ueber sexuelle Differenzierung und relative Sexualität. [Sexual differentiation and relative sexuality.] Studia Mendeliana. P. 203-223. 10 fig. Typos: Brunn, Czecho-slovakia, 1923.

1670. HARTWELL, G. A. Note on the colour changes in rat's fur produced by alterations in diet. Biochem. Jour. 17: 547-548. 1923.—Brown-black rats which were fed during the summer months on a diet consisting of bread and whole milk gradually became a gray-fawn color. It was not possible to produce such changes in the winter. When white colored rats

were fed on a diet which contained large quantities of protein rich in tyrosine and tryptophan, the coat color became black. The result supports the view that melanins are formed from tyrosine and tryptophan.—*H. C. McPhee*.

1671. HERIBERT-NILSSON, NILS. Das Ausbleiben der dominanten Homozygoten in Bezug auf die Nervenfarbe bei *Oenothera Lamarckiana*. [The absence of dominant homozygotes in the case of the nerve color of *O. Lamarckiana*.] *Hereditas* 6: 387-391. 1925.—A set of experiments to determine whether the absence of dominant homozygotes in the case of the nerve color of *O. Lamarckiana* can best be explained on the basis of the elimination hypothesis advanced earlier by the author, and championed by Renner; or on the prohibition and substitution theory later developed by the author. The method employed was to pollinate flowers so scantily that the number of pollen tubes penetrating the ovaries was less than the number of ovules. According to the prohibition and substitution hypothesis, the ratio of red to white should in this case be 3:1, but according to the elimination theory, the ratio should be 2:1. As a result of these experiments, a ratio of approximately 2:1 was obtained, thus proving that in the case of this character dominant homozygotes are formed, but are subsequently eliminated, and hence fail to make their appearance.—*Ralph E. Cleland*.

1672. HILDEN, KAARLO. Zur Kenntnis der menschlichen Kopfform in genetischer Hinsicht. [The genetics of human headform.] *Hereditas* 6: 127-146. *Fig. 1-3*. 1925.—After a short summary of the literature on the inheritance of headform as measured by the length-breadth index, the author presents new data on the cephalic index, consisting of the head length and breadth measurements of 232 subjects from the small Swedish island of Rünü. The inhabitants of this island are said to be closely interrelated, and to form a relatively homogeneous racial group. The means and variation constants of the adult inhabitants are given. A study of the data arranged by families leads the author to conclude that head form is determined by multiple cumulative factors, and that short-headedness (brachycephaly) is dominant to longer-headedness (meso- and dolichocephaly).—*L. C. Dunn*.

1673. HOWITT, J. E. A review of our knowledge concerning immunity and resistance in plants. *Ann. Rep. Quebec Soc. Protection Plants* 16: 9-24. 1925.—Numerous instances are 1st cited wherein material progress has been made in the control of various diseases of cultivated plants through the development of resistant varieties. The causal factors of resistance in plants are divided into 2 main groups: (1) Those which contribute to apparent resistance and (2) those which are responsible for true resistance. Under apparent resistance are cited cases of disease escape and disease tolerance. Under true resistance are described numerous instances where the disease is withstood or prevented because of anatomical or morphological characters of the host on the one hand, and because of biochemical properties of the cell contents on the other. A list of 213 citations is appended.—*J. C. Walker*.

1674. IMAI, YOSHITAKA. Genetic studies in morning glories. XII-XIV. (Japanese.) *Bot. Mag. Tôkyô* 38: (127)-(142), (185)-(220), (233)-(242). *Illus.* 1924.—A certain number of Mendelian factors concerning the leaf character, and some cases of mutations and linkages are described.—(*Courtesy Japanese Jour. Bot.*)

1675. JACK, H. W. Variation in coconuts with particular reference to fruit production. *Malayan Agric. Jour.* 13: 25-63. *Fig. 1*. 1925.—The variation found in coconuts is discussed and data are presented which indicate that certain trees are good producers while others are poor producers. An apparent correlation was noted between upright, close habit of branching and poor yielding ability. Individual palms varied in the age at which they reached maturity, and apparently in the amount of copra per nut.—*Richard Wellington*.

1676. JEFFREY, EDWARD C. *Drosophila* and the mutation hypothesis. *Science* 62: 3-5. 1925.—In order to overcome the difficulties experienced by previous workers in obtaining clear preparations of spermatocytic divisions in *Drosophila melanogaster* the author has employed "quantity methods"—sectioning 40-50 whole pupae simultaneously in nitrocellulose, after fixing in Carnoy's fluid, aided by an air pump. In this way he has obtained "hundreds of divisions of the spermatocytes without observing a single normal mitosis" among them. The abnormalities mentioned consist in asynchronous movement of the chromosomes towards the poles ("lagging"). This, it is claimed, establishes the hybrid origin of the species



and proves that "the Morgan hypothesis of mutation" and the conclusions of *Drosophila* workers concerning the laws of heredity and the origin of species are erroneous—"a fantastic Fata Morgana," arising out of study "of a single aberrant species," study "too superficial," too "purely experimental," and too easily having "been acclaimed at once by almost the entire body of biologists . . . to warrant expectation of long life."—*H. J. Muller*.

1677. JEFFREY, E. C., AND G. C. HICKS. The reduction division in relation to mutation in plants and animals. *Amer. Nat.* 59: 410-426. Fig. 1-8. 1925.—Irregular chromosome behavior in plants and animals is indicative of hybrid origin. In *Drosophila melanogaster* the chromosome behavior at the time of reduction is irregular and indicates the hybrid nature of this species. The authors question the value of genetic hypotheses based on work with *Drosophila*.—*K. Sax*.

1678. KAHN, EUGEN. Erbbiologisch-psychiatrische Übersicht. [Genetic-psychiatric survey.] *Zeitschr. Indukt. Abstamm.- u. Vererb.* 38: 75-83. 1925.—The author gives a short summary of several recent German publications, and an estimate of our present knowledge of the inheritance of dementia praecox, manic depressive insanity, epilepsy, Huntington's chorea, general psychopathic conditions, some forms of parapsycho, and of alcoholism.—*L. C. Dunn*.

1679. KAKIZAKI, YOITI. The flowering habit and natural crossing in the egg-plant. *Japanese Jour. Genetics* 3: 29-38. 2 fig. 1924.—In normal flowers of *Solanum melongena* the anthers form together a cone around the style, with the stigma projecting beyond; hence the body of a visiting insect comes 1st of all in contact with the stigma. Owing chiefly to this flower construction, natural crossing is very frequent, as the author proved by culture experiments. When a black type plant (skin of unripe fruit and vegetative parts black) is crossed with a white type plant, the  $F_1$  plant is black and the  $F_2$  offspring are composed of 3 black : 1 white. For experimentation, the 2 types were planted promiscuously in 1 field and seed from the white type gave rise the following season to 6.75% black offspring, which naturally is due to the cross fertilization white  $\times$  black. When each flower was considered separately, it was seen that the number of hybrid seed from each was 0.2-46.8%, and in most cases under 10%. In a total of 63 flowers examined none were found which produced no hybrid seed at all. Flowers emasculated and left to natural pollination bore fruit very rarely, nor did plants placed in a screened house, to prevent insect visits, produce many fruit.—*Author (Courtesy Japanese Jour. Bot.)*

1680. KIKUTI, AKIO. Origin of Japanese pears and inheritance of the skin colors of their fruit. *Japan. Jour. Genetics* 3: 1-21. 5 fig. 1924.—Though in Japan there are several native species of *Pyrus*, the cultivated varieties of Japanese pears are derived from *P. serotina* Rehder, native to Middle and Southern China, the varieties of the latter strain being also cultivated in these regions. Those grown in Northern China and Manchuria are believed to have originated from *P. ussuriensis* Max., *P. ussuriensis* var. *ovoidea* Rehder, or *P. Bretschneiderii* Rehder, of which the 2 former are the principal sources of the modern Korean varieties. The skin color of Japanese varieties of pears belongs to either of the 3 types, russet, green and intermediate, that is, green imperfectly covered with russet. For the inheritance of skin-color the following factors are responsible:  $R$  and  $r$  are for russet and green, respectively; the zygote  $Rr$  is russet, yet much weaker in its color intensity than  $RR$ , and though it remains russet under humid condition, it changes to intermediate under dry condition;  $RR$  remains always russet. In the presence of another factor  $M$ ,  $Rr$  remains russet, but in its absence it becomes intermediate. The genetical constitutions of the phenotypes in regard to the skin-color of the fruit are consequently as follows: (1) Russet: (a) Constant russet— $RRMM$ ,  $RRMm$ , and  $RRmm$ . (b) Modifiable russet— $RrMM$  and  $RrMm$ . (2) Intermediate— $Rrmm$ . (3) Green— $rrMM$ ,  $rrMm$ , and  $rrmm$ .—*Author (Courtesy Japanese Jour. Botany.)*

1681. KRANTZ, F. A. Potato improvement by selection in self-fertilized lines. *Potato News Bull.* 2: 303-304. 1925.—Selection in self-fertilized lines followed by crossing between inbred lines is a favorite method for improving normally cross-pollinated crops. The applicability of this method to potato improvement has been tested at the Minnesota Experiment Station. Continued self-fertilization has been found possible and one line after 4

selfed generations breeds true for its principal commercial characters. The vigor of self-fertilized lines is reduced but not to an extent that precludes perpetuation through seed. Heterosis is shown to a marked degree both in inter-varietal crosses, and in crosses between inbred lines. The prediction is ventured that by this method varieties superior to present commercial types may readily be secured.—*F. Weiss.*

1682. KUNIEDA, HIROSHI. The spermatozoid of *Sargassum*. (Japanese.) Rept. Fishery Soc. 4: 93-96. 2 fig. 1924; Bot. Mag. Tōkyō 38: (291)-(293). 3 fig. 1924.—The spermatozoid of *Sargassum Horneri* was several times observed by the author. Its body is slender and provided with 2 cilia in opposite directions and laterally inserted, each measuring nearly twice its length. When the antheridia protrude from the conceptacle and adhere to the surface of the receptacle, being enveloped by the mucilage, the spermatozooids therein begin to move and, after being liberated, make active motion. As the author was able to observe many actively moving spermatozooids around the oogonia out of the conceptacle and attached to the surface of the receptacle by the mucilage enveloping them, it is evident that fertilization takes place about that time.—*Author (Courtesy Japanese Jour. Bot.)*

1683. LENZ, F. Muss das Nachdunkeln der Haare als Dominanzwechsel aufgefasst werden? [Should the secondary darkening of the hair be called a change of dominance?] Arch. Rass.- u. Gesellschaftsbiol. 16: 428-435. 1925.—Observations made in certain parts of Europe show that about  $\frac{3}{4}$  of the children have light hair while only about  $\frac{1}{4}$  of the adults have light hair. This condition is probably due to a developmental phenomenon rather than to a change of dominance of certain color factors. It is suggested that the change may be due to hormone action. Such an assumption is based on the possibility that hormones produced by the mother during the prenatal life of the child are different in their effect on hair color from those produced by the child in later years.—*H. C. McPhee.*

1684. LESAGE, PIERRE. Sur la stabilisation de caractères dans les plantes salées. [The stabilization of characters in salt-treated plants.] Compt. Rend. Acad. Sci. Paris 168: 1003-1005. 1 fig. 1919.—Cultures of *Lepidium sativum* watered with NaCl solution through 8 generations were compared with controls supplied with ordinary water, the effect on the form of the seed being especially considered. It was found that gradual changes occurred from 1 generation to the next until finally the seed were definitely shorter and plumper than in the controls. The author refers to this effect as a "provoked" character and discusses the possibility of this becoming stabilized after many generations under the same conditions as an acquired character or even an hereditary trait.—*H. V. Hendricks.*

1685. MAEKAWA, TOKUJIRO. On the phenomena of sex transition in *Arisaema japonica* Bl. Jour. Coll. Agric. Hokkaido Imp. Univ. Sapporo 13: 217-305. 1 pl., 9 fig. 1924.—*Arisaema japonica* is a dioecious plant. The author's observations from 1917 to date have shown the fact that even in the same individual the sex may vary in different years. The transformation of the asexual condition in 1 year to the ♂ in another, and of the ♂ to the ♀ has been most frequently observed, while the corm in the ♀ condition has rarely been transformed into the other. By following the manner of sex transformation of a single corm for 3-5 successive years, the author found that this process does not occur at random under ordinary conditions but proceeds from the asexual state to the ♂ and then from the latter to the ♀, whereupon the sex remains unchanged—"normal process of sex transition." However, transformations in the opposite direction have occasionally been met with. In the case of those corms which transform in the reverse direction, they have changed from the ♀ to the ♂ condition and then from the latter to the asexual—the process of "retro-transition of sex."—The influence of sandbed cultivation, that is, of extreme conditions, on the sex transition, was studied, and it was found that it takes place in the same way as under normal conditions, though the rate of transition is reduced. It appears that the sexual expression of corms is correlated with their respective weights. Though there is an overlapping between the weights of the corms of each of the 3 conditions, it is seen that the general limiting line between asexual and ♂ conditions lies at 4 gm., and that between ♂ and ♀ at 21 gm.—The transitions from ♀ to ♂ state, as well as from the latter to the asexual state, are generally accompanied by decrease in corm weight, and this transition



takes place most frequently when the latter stands near the limiting line between every 2.—Various experiments were made to control the sex condition—partial cutting of leaf blades, removing all vegetative organs above ground, partial cutting of corm body, and cultivation in a dark room. By such means the weight of corm has been more or less reduced and, as a consequence, in many cases the retro-transition has taken place. The recovery of weight in the next year has led to the original state of sex.—It is concluded that the cytological and Mendelian interpretation of the sex determination now in current use is not applicable to *Arisaema japonica*. Here the sex is determined by the quantity of the formative assimilative products in the fresh form before they are stored up in the reserve organ. If the growth of the vegetative shoots becomes weakened or impaired the sexual expression is reversely transformed from ♀ to ♂ and from ♂ to asexual—"the process of retro-transition of sex." Some irregular transformations are similarly explained under this point of view. The corm weight has no direct influence upon the sex determination; the greater the weight, the larger is the size of the assimilation organs produced and consequently the greater is the quantity of the formative assimilation products. Thus, though the relation of the corm weight to the sex determination is merely indirect, it may well serve as an index of the sexual expression.—*Author (Courtesy Japanese Jour. Bot.)*

1686. MEIROWSKY. *Kleine Beiträge zur Vererbungswissenschaft. I. Über Vererbung von Kinn- und Wangengrübchen.* [Brief contributions to the science of heredity. I. Inheritance of chin- and cheek-dimples.] Arch. Rass.- u. Gesellschaftsbiol. 16: 439-443. Fig. 1-3. 1925.—Siemens assumed that identical twins (twins derived from one egg) are genetically uniform, but that in exceptional cases such twins may not be uniform in their hereditary factors. The latter assumption was not supported by data, and Siemens assumed that differences in identical twins are due to environmental influences. The following questions are to be answered: Are chin- and cheek-dimples conditioned by genetic factors? Are variations present in identical twins paratypically conditioned? Is the dogma of genetic uniformity in identical twins not valid? Anatomically, cheek-dimples depend on muscular attachments to the skin. It is noted that well-developed cheek-dimples of early life disappear in old age.—Case 1. Identical twins, whose maternal ancestry for 3 generations possessed double cheek-dimples and whose father possessed a chin-dimple, are alike in gross bodily appearance and in color of hair and eyes, but one has a weak dimple in each cheek while the other has a deep dimple in the right cheek but none whatever in the left. They also differ notably in temperament and intelligence.—Case 2. Identical twins, whose mother and grandmother had both cheek- and chin-dimples, are so closely similar in all respects that many can distinguish them only by the fact that one has cheek-dimples while the other has none.—Case 3. Identical twins, 27 years of age, resemble each other in color of hair and eyes, fissure on nose and upper lip, hair on upper lip, single hairs on neck, and dorsal striae. They differ in shape of nose, orientation of upper teeth, and in that one has a deep chin-dimple, while the other (seen only in photograph) has a slightly depressed stripe in the surface of the chin about 2 cm. long and 1 cm. wide.—Case 4. Identical twins, who are alike in complexion and other physical features, including chin-dimples exactly alike in location, size and depth, differ in shape of external ears and to a marked degree in temperament.—The 4 cases show that a character which is obviously genetically conditioned may be absent or developed in different degrees in identical twins. If we assume that differences in identical twins are due to non-hereditary factors, then we must admit that such factors cause differences in chin-dimples and great temperamental differences. But identical twins may not be genetically uniform. If they are not, Siemens' sweeping conclusions are erroneous. This fundamental question can be decided only after investigation of many hundreds of twins.—*E. B. Babcock.*

1687. METZ, CHAS. W. *Chromosomes and sex in Sciara.* Science 61: 212-214. 1925.—An apparently unique type of chromosome relations between the sexes is found in 3 species of *Sciara* (Diptera). The ♂ has the same chromosome group as the ♀ plus 2 large sex-limited chromosomes unlike any of the others. These differ from ordinary Y-chromosomes in having no mates among other chromosomes and showing no segregation from any of the others. They do not undergo synapsis and do not divide at the 1st division. The 1st division is not described. At the 2nd, both are present and both divide, giving daughter halves

to all spermatids. This division is unequal, both as regards cell and chromosomes. All chromosomes divide, but both halves of 1 (not 1 of 2 large ones) go to 1 pole. This remains in the cell; the other pole is budded off like a polar body. Since all spermatids receive both of the large chromosomes, sperms should all be ♂-determining. Females, therefore, should arise by parthenogenesis or gynogenesis (as in *Rhabditis*) unless some chromosome elimination occurs. Simple parthenogenesis does not occur—♀ must be fertilized to give offspring. Unequal sex-ratios and unisexual broods were found.—*Author*.

1688. M'INTOSH, T. P. **Potato breeding.** Gard. Chron. III. 77: 114, 133-134, 151-152, 256-257. *Fig. 14-21*. 1925.—Characters that have been found to be correlated in the potato are briefly mentioned, as also the characters that have been noted to segregate according to Mendelian ratios.—Characters which have behaved as dominant in studies on inheritance in the potato are noted. The technique involved in crossing varieties and seedlings is discussed in relation to their flowering habit: (1) "When the ♀ parent does not set berries naturally," (2) "where the ♀ parent forms natural berries," and (3) "the fertilization of varieties which seldom flower." Brief discussions are given on the treatment of seed and seedlings, the avoidance of virus diseases and discarding of seedlings, and on the securing of potato seedlings which are resistant to diseases but still possessed of other desirable qualities. The author believes it unnecessary to go outside of the species *Solanum tuberosum* to obtain desirable characters. Since "bolters" mature later than the normal plants, they are not recommended for use in breeding early varieties. With the exception of late blight, early varieties are not correlated with susceptibility to foliage diseases.—*Richard Wellington*.

1689. MORGAN, L. V. **Polyploidy in *Drosophila melanogaster* with two attached X-chromosomes.** Amer. Nat. 59: 148-177. *Fig. 1-6*. 1925.—Further tests are described of females having 2 X-chromosomes attached to each other (1st reported by L. V. MORGAN, 1922). One such fly, found by T. H. MORGAN, had received in addition a 3rd X, unattached, from the father, as shown by genetic tests based on the fact that the attached X's contained yellow and the free X contained bar; intersexes appeared among the offspring of the same fly. Sturtevant had also found a line of flies proved genetically to have 3 X's, 2 of which had become attached (as described below) and 1 free; this too had given intersexes. Sturtevant concluded that the 3-X flies of both these lines were probably triploids. Cytological examination of L. V. Morgan's 3-X flies proved this to be true, and genetic tests gave in F<sub>1</sub>, F<sub>2</sub>, F<sub>3</sub>, etc., the various combinations of sexual and sex-linked characters to be expected from triploids having 2 of their 3 X's attached, although the numbers in which the classes appeared were very aberrant. Introduction of autosomal genes also resulted in the classes to be expected from triploids. Similar triploid females have been found to originate twice, since the above 2 cases, from diploid mothers having attached X's, and presumably triploid intersexes have originated from such mothers 3 times. In the triploids, crossing over was found to occur between the free X and either or both of the attached X's. The crossovers had attached X's whenever and only when they received the right-hand end of an attached X; this proved attachment to be at the right end. Diploid offspring having attached X's which, by previous crossing over with the free X, had become different from each other (heterozygous) in the same region, produced in the following generation some flies in which the attached X's were alike (homozygous), in the same region in which they had previously been heterozygous. This could only come about by crossing over occurring at a stage in which both the synapsed homologous chromosomes have split longitudinally,  $\frac{1}{2}$  of one of the attached homologues crossing over with the other half (not connected with it) of the other homologue, so that parts of 2 identical (sister) strands become transferred to opposite sides of the attachment point, and reconnected together. It was also found that the connected halves of 2 synapsing homologues might both cross over simultaneously (that is, in the same oöcyte), but whether they cross over with each other or with the halves of the synapsing homologues not connected with them could not be determined, as the double-X crossovers resulting would have the same composition in either case. As for the autosomes in diploids having the attached X's, their crossing over was found to be unaffected. One female which was proved by genetic tests to be tetraploid, containing 2 attached and 2 free X's, was thrown by a triploid having 2 attached and 1 free X. All except possibly 1 (tetraploid) out of the 57



offspring of the tetraploid were triploids (females or intersexes); some were crossovers.—Tests of 72 offspring of diploid, attached-X flies carrying (single  $\pm$ ) X's derived from the double X by breakage gave no evidence of duplication of the locus of bar, or deficiency of the loci of yellow or forked; this was taken as indicating that breakage had occurred at or near the attachment point. About 14 females carrying 2 paternally derived X's, owing to equational non-disjunction in the male, were found amongst offspring of double-X females. In one such case, found by Sturtevant, the 2 paternal X's were attached together, by a new origination of the attached condition. Sturtevant's triploid above referred to appeared among descendants of this fly. Three mosaic flies, in part diploid female with attached X's and in part diploid "superfemale" with 1 free and 2 attached X's, were found; 2 of these bred, as females. Another (mosaic?) female gave aberrant results (similar to what would have been expected if some of her oöcytes had contained 1 free paternal X and 2 attached X's and others 1 free paternal X and 1 X derived from attached X's by breakage; her somatic appearance conformed with the latter composition).—*H. J. Muller.*

1690. MULLER, H. J. Why polyploidy is rarer in animals than in plants. *Amer. Nat.* 59: 346-353. 1925.—There is abundant evidence for the occurrence of tetraploidy as an evolutionary process in plants, but little or none for animals, even though tetraploidy occurs not infrequently in animal cells. The reason that tetraploid races of animals can so rarely become established is because most animals are bisexual and have their sex determined by a mechanism which functions properly only in the diploid state. For (1) in the triploid—a frequent intermediate step in tetraploid formation—one sex or the other is represented by a sterile intersex and the process of chromosome multiplication must cease. (2) If, however, a tetraploid has somehow been formed, the tetraploidy can persist only so long as this breeds with other tetraploids; otherwise triploids and sterility will result. (3) Such a line of tetraploids would be at a reproductive disadvantage because the X or Z chromosomes in the heterozygous sex would not tend to travel to the same pole at the reduction division; in fact they would tend to disjoin; this would result in the majority of the population consisting of sterile intersexes. (4) This disadvantage would be overcome if the 2 X's or Z's had become united, but such union is a rare event, and attached X's or Z's in the preexisting diploid race would have tended to eliminate themselves through formation of sterile "supersexes" and inviable no-X or no-Z individuals. This theory should receive confirmation through the findings of tetraploidy in animals without this method of sex-determination, and of its absence in dioecious plants having such a method. This general difference between plant and animal evolution should result in the eventual finding of various (stated) differences in their genetic behavior.—*Author.*

1691. OINOUE, YASUJI. Researches on variations caused by the graft in grapes and other fruit trees. (Japanese.) *Bull. Inst. Oinoue* 1: 13-72. 1924.—After many years of experimental studies the author concludes about grafting as follows: (1) The affinity should be divided into (A) pseudo-affinity, (B) incomplete affinity, and (C) complete affinity; (2) the affinity depends upon the histological and physiological similarities; (3) it is best when the polarity is not disturbed; (4) it is greatest, the nearer the sections of the nodes; (5) between different species or genera the affinity is of various intensity according to different races; (6) the affinity between hybrids is proportional to the specific affinity of their components; (7) between different species or genera the double or triple graft gives good results (for example, in grapes, *Vinifera* may be grafted to *rupestris* on *rotundifolia*); (8) hybrids for the use of indirect stock must be newly made; (9) between different species or genera, the affinity is not the same when the scion and stock are reversed; (10) the graft variation is not inherited; nor (11) is it ever fixed; (12) it may cause bud variation, and (13) sometimes leaves after effects; (14) the substances special to the scion or stock, according to their nature, may or may not pass either from scion to stock or from stock to scion; (15) dwarfness is due to the small quantity of water absorbed relative to the diameter of the main stem; (16) therefore a scion grafted on a stock absorbing little water becomes dwarf; (17) the bourret of the graft decreases the quantity of water absorbed; (18) mechanical obstacle to the absorption of water is caused not only by the bourret, but also by the smaller diameter of stock; (19) the mechanical action of the bourret is due to the anastomosis of the absorbing tubes; (20) the

obstacles caused by anastomosis decrease year after year; (21) several anatomical structures are mixed at the bourret, but separate out at the end of the bourret; (22) when the transpiratory power is not equal to that of absorption,  $X > Y$  causes the tallness,  $X < Y$  causes the dwarfness, where  $X$  = absorbing power,  $Y$  = transpiratory power; (23) the growth after grafting is (when  $V_s = V_g$ )  $V_g - (a + a')$  or  $V_s - (a + a')$ , and (when  $V_s \leq V_g$ )  $\frac{V_g + V_s}{2} - (a + a')$ , where  $V_s$  = growing power of stock,  $V_g$  = growing power of scion,  $a$  = decreased power caused by the mechanical obstacles,  $a'$  = decreased power caused by the physiological differences; (24) longevity of scion is due to the adaptability of the stock to the soil and  $L = (L^2 + l^2) - 1$ , where  $L^2$  = longevity of scion,  $L$  = longevity after grafting,  $l$  = decreased quantity mechanically caused,  $l^2$  = increased or decreased quantity caused by the living power of stock,  $l^2$  is sometimes zero, sometimes positive, and sometimes negative.—The scion allows the fruit to mature early when the stock absorbs little water; the sap is denser and the maximum quantity of potassium and phosphate are absorbed early. The fruit of the scion are more sugary and the compactness of the grape clusters is dense for the same reason. The size of the fruit is generally less under these conditions.—*Author (Courtesy Japanese Jour. Bot.)*

1692. OINOUE, YASUJI. **Studies on the formation of seedless grapes.** (Japanese.) Bull. Inst. Oinoue 1: 1-12. *Illus.* 1924.—Parthenocarpy in grapes has been observed by various investigators and they concluded that seedless grapes are formed because of non-fecundation, owing to the inability of the pollen to germinate. There are several varieties which never possess seed under normal conditions nor by artificial cross-pollination.—The author reinvestigated this question, bagging the flower clusters of the Tchekerdeksiz (Thompson's Seedless) and White Corinth varieties with various colored papers—red, white and blue. The bagged clusters produced berries with seed, except those under the red paper in White Corinth; in the other variety all produced seed.—The author then bagged the other clusters of Tchekerdeksiz with ordinary paraffined paper and divided them into 3 lots: In (1) the flowers were emasculated and pollinated with Aramon pollen; in (2) they were emasculated alone; and in (3) they were self-pollinated. In (1), fully developed berries were formed; in (2), the smallest berries were produced; and in (3), normal development took place, the berries being medium-sized and of normal compactness.—The author examined the capacity for germination of pollen in these 2 varieties and observed that about 80% germinated in the ordinary glucose solution at 25°C. The author observed that the pollen tube began to develop 40 minutes after pollination and passed the style in 22 hours. The swelling of the ovary began 50 minutes after pollination and just when the pollen tube began to enter the pistil. The ovule of seedless grapes is not degenerated, but fecundation stops suddenly soon after, and consequently seed are not formed.—The author concludes that the so-called seedless grapes are not due to the parthenocarpy, but to incomplete fecundation which he calls "quasi-fecundation."—*Author (Courtesy Japanese Jour. Bot.)*

1693. OINOUE, YASUJI. **The stability of the factors and the fixation of the acquired characters.** (Japanese.) Bull. Inst. Oinoue 1: 101-120. 1924.—The author holds an opinion against the current theories of the formation of new varieties and species. He states that the theory of mutation is unconvincing because many plants and animals produce fixed variations under culture or domestication non-periodically and with strong intensity towards the direction desired, leaving their ancestors almost non-variable at the native spots. Dahlias, sweet peas, azaleas, grapes, pears, for instance, have given us thousands of varieties under culture with more or less fixed characters, though their wild ancestors cast offspring with the slightest variation. The author denies the current explanation that these phenomena are due to natural selection which saves the fittest and eliminates the others.—He succeeded in getting the yellow and rose varieties of wild chrysanthemum after 5 generations of most intensive and careful culture (about 0.3% of the seedlings) and proved the fixity of these colors in the next generation. He then planted the new varieties in the uncultivated soil where he gathered the wild ancestors. Though he has repeatedly sown seed from these original wild plants during 5 years he did not obtain new colors, yet seed of the new varieties grown at the same spot continued to breed true. These new races of chrys-



anthemum are of as strong and robust a nature as their wild ancestors and the flowers are self-fertile. The author obtained similar results with many other plants. His conclusions are: (1) Variations appear under the influence of the environment in the pure-lined races as primary variations (physiological variations). (2) Similar environment, when repeated generation after generation, causes variation, and exerts its influence on the germ-cells. (3) If the same environment continues to influence further generations, great variation will occur. This variation is accompanied by fixed characters and corresponds to the mutation of H. de Vries. The author discusses at length his hypothesis on variation.—(Courtesy Japanese Jour. Bot.)

1694. PETCH, T. Meristic variation in *Loranthus*. Ann. Roy. Bot. Gard. Peradeniya 9: 239-241. 1924.—Variations are recorded in the number of petals and stamens in 8 species. In general, the number of petals and stamens remained equal, unequal numbers being found in only 7 flowers in a total of 10,292. Variation consisted mainly in the reduction of the number of parts; but in 1 species the majority, and in another all of the abnormal flowers had increased number of parts.—E. B. Babcock.

1695. PONTIER, G. Les éléphants fossiles d'Angleterre: Mutations de l'*Eléphas antiquus* Falconer dans le Pliocène supérieur et la Quarternaire anglais. [Fossil elephants of England: mutations of *Elephas antiquus* Falconer in the upper Pliocene and the English Quarternary.] Compt. Rend. Acad. Sci. Paris 177: 341-343. 1923.—Among the numerous remains of elephants found in the geological layers of Great Britain are several which probably represent mutations from the group to which *E. antiquus* belongs. In Sicily, *E. antiquus* is represented by a mutation intermediate between *E. ausonius* and *E. antiquus*. In Great Britain, the principal groups are *E. antiquus* and a parallel group, *E. priscus*. It is probable that *E. priscus* came from a Mediterranean group which also gave rise to *E. atlanticus*. It is probable that this race penetrated England but disappeared at about the same time as *E. antiquus* and *E. priscus*.—H. C. McPhee.

1696. POTTIER, JACQUES. Les dimensions cellulaires des feuilles dans le genre "*Timmia*" et leurs variations avec l'altitude. [Cell dimension of leaves in the genus "*Timmia*" and their variations with altitude.] Ann. Sci. Nat. Bot. Ser. 10. 5: 321-342. 1923.—Thinking it might be possible to establish a classification of the mosses based on the cellular index or number of cells per sq. mm. of leaf surface, the author gives a detailed account of the methods and results of such measurements in 7 species of *Timmia*. These results are summarized in a table which also gives the locality, altitude and collector. The cellular index decreases with altitude and the leaves also become shorter and broader. High altitudes and high latitudes have the same effect. From a systematic standpoint he concludes that his results are negative.—Charlotte Elliott.

1697. RANGASAMI AYYANGAR, G. N. Natural crossing in summer cholam,—a problem in seed purity. Jour. Madras Agric. Students Union 12: 232-235. Illus. 1924.—It has been ascertained that there is as much as 7% natural crossing in summer cholam. In order to maintain purity of seed the writer suggests introducing into an improved strain some easily distinguishable recessive character in order that crosses may readily be seen and pulled out.—Charlotte Elliott.

1698. REED, GEORGE M. The inheritance of resistance of oat hybrids to loose smut. Mycologia 17: 163-181. 1925.—*Avena nuda* var. *inermis* was used as ♀ parent, this variety is very susceptible to *Ustilago Avenae*; *Avena sativa* var. *montana* (Black Mesdag), almost immune to *U. Avenae*, was used as ♂ parent. In the F<sub>2</sub>, inoculations were made with the smut, and the results indicated that resistance is dominant, and susceptibility recessive, with a single factor difference; F<sub>3</sub> families of the resistant F<sub>2</sub> plants were grown, and gave further evidence of the single factor difference, as did also the F<sub>4</sub> plants tested. Various combinations of morphologic characters were obtained with the resistance to smut, so that new types of resistant oats, some with hullless and some with hulled grain, may be developed. The few-flowered hulled type of spikelet is evidently recessive.—G. R. Bisby.

1699. RENNER, O. Die Scheckung der *Oenotherenbastarde*. [Checkering in the *Oenothera* hybrids.] Biol. Centralbl. 44: 309-336. 7 fig. 1924.—Defective inheritance of green- ing is a rather widespread phenomenon among the *Oenotheras*. It probably results from the

fact that the plasmas or at least the plastids of the various species are usually not identical, and the plastids cannot function when associated with strange nuclear combinations or with foreign plasmas. In many cases, defective inheritance of greening takes the form of checking, or of chimeras of various types, which are described. The author suggests that this is due to the introduction into the fertilized egg of plasma from the pollen parent by way of the pollen tube, this plasma carrying plastids or what give rise to plastids. The plastids from one parent may be unable to turn green in the presence of the nuclear combination resulting at fertilization, while those from the other parent may function. The plastids from the 2 parents are segregated early in the embryo into different cells, so that patches of cells bearing functional or non-functional plastids result. If the plastids from neither parent can function in the presence of a certain nuclear combination, that plant is colorless, and dies. In other cases those from both parents may function, resulting in a pure green plant. A summary is given of a large number of experiments to determine the relation of the plastids and plasmas of the various species to one another. For the most part, the species tested differed from one another in this respect. These differences are considered the result of cytoplasmic mutation, which the author classes as true mutation, since the plastids and cytoplasm are carriers of heredity as well as the nucleus.—*R. E. Cleland.*

1700. RICHET, CHARLES, EUDOXIE BACHRACH, ET HENRY CARDOT. *Fixation héréditaire des caractères acquis, constaté par la stabilité de l'optimum thermique déplacé.* [The hereditary fixation of acquired characters, established by the stability of the displaced thermal optimum.] *Compt. Rend. Acad. Sci. Paris* 180: 1997-1998. 1925.—This supplements a previous article upon experiments with bacteria by reporting that the acquired characters persist for 60 days. The conclusions are: (1) Prolonged action of a salt profoundly modifies the biology of the cell, (2) 2 acquired characters have been so induced, (3) these characters are hereditarily fixed.—*H. M. Hall.*

1701. RICHET, CHARLES, EUDOXIE BACHRACH, ET HENRY CARDOT. *L'hérédité des caractères acquis constaté par le déplacement de l'optimum thermique.* [The inheritance of acquired characters established by the displacement of their thermal optimum.] *Compt. Rend. Acad. Sci. Paris* 180: 93-98. 1925.—The transmission of acquired characters and the formation of a new species are said to be demonstrated by experiments of the authors. Lactic bacteria cultivated 3 years in the presence of KCl possess an optimum temperature 6° higher than the control. This is determined by the rate of multiplication and by acidity. Tolerance for KCl is also developed. These characteristics persist in successive generations after suppression of the causal factor. Possible practical applications are pointed out.—*H. M. Hall.*

1702. SATINA, SOPHIA, AND M. DEMEREC. *Manoilov's reaction for identification of the sexes.* *Science* 62: 225-226. 1925.—The test is performed with the blood of an animal or the alcoholic extract of a plant. The 5 reagents are listed and the exact procedure is described. Male organisms cause the test solutions to become colorless but the color is retained in the case of the ♀.—*C. J. Lyon.*

1703. SAWYER, M. LOUISE. *Crossing Iris pseudacorus and I. versicolor.* *Bot. Gaz.* 79: 60-72. *Pl.* 5-10, 1 fig. 1925.—Failure to obtain normal seed from this cross after the ovaries had given promise of producing normal seed, led the writer to a detailed study of the cause of failure. It was found that the pollen tubes reached the micropyle as early in the case of crossed material as in selfed. Death of the zygote or embryo, however, was found in all the crossed material. The endosperm of the crossed material was also abnormal.—*B. W. Wells.*

1704. SEELHORST, C. V. *Über Vererbungerscheinungen bei Kartoffeln.* [Inheritance phenomena in potatoes.] *Jour. Landw.* 66: 141-162. 1918.—The author claims to have shown in earlier papers (1900 and 1904) that the productivity of single potato plants is heritable but that his data did not prove with any certainty the occurrence of inheritance with respect to tuber number. With a view to securing data regarding tuber prolificacy, selections were made of high and low yielding hills from the 5 varieties, Belldonna, Deodora, Industry, Helios and Gratiola. The number and weight of tubers from each hill were recorded and certain hills were selected for planting the ensuing season of 1917. With the exception of the variety



Helios, tubers from the high-yielding hills produced a larger crop and a larger average number of tubers per set than those from low-yielding hills. The smallest tubers from high-yielding mother plants gave larger crops than the largest ones from low-yielding plants. It was almost always the case that plants originating from high-yielding hills bore a larger number of tubers than those from low-yielding hills.—*W. Stuart.*

1705. SINOTO, YOSITO. On chromosome behavior and sex determination in *Rumex acetosa* L. Bot. Mag. Tôkyô 38: (153)–(162). 40 fig. 1924.—In the present paper the author dealt chiefly with the relation of chromosome behavior and sex determination in *Rumex acetosa*, and confirmed in the main the results of Kihara and Ono concerning the same subject (See Bot. Absts. 13, Entry 3333; 14, Entry 316.) [Absts., Japanese Jour. Bot. 2: 1924, Entries 33, 34.]—*Author (Courtesy Japanese Jour. Bot.)*

1706. SIRKS, M. J. Die gynanthere Form des Goldlocks und ihre Vererbung. [The gynantherous form of wallflower and its heredity.] Genetica 6: 537–548. Fig. 1–9. 1924.—When crossed with pollen of a pure-breeding, yellow-brown variety, the  $F_1$  was uniformly dark red and normal. In the  $F_2$  there were 358 normal: 50 gynantherous plants. In 3 families, 210 plants were dark red; 91, yellow-brown. The author considers these as 3:1 ratios modified by selection of the weaker classes due to the severe climatic conditions of 1923–1924. The 4th family gave a small number of clear yellow and yellow-violet plants in addition to the expected classes. A 3-factor hypothesis is presented in explanation of this fact.—*Margaret Mann Lesley.*

1707. SOUTHEE, E. A. The inheritance of fecundity in fowls. Agric. Gaz. New South Wales 36: 648–652. 3 fig. 1925.—An experiment, inaugurated in 1922, consists in breeding different families of White Leghorns. All ♀'s are pen-tested. No report is made of the experiment. Results secured by Pearl are discussed.—*L. R. Waldron.*

1708. SPINKS, G. T. Notes of strawberry breeding. Univ. Bristol Ann. Rept. Agric. and Hort. Res. Sta. 1923: 117–125. 1923.—The article contains a discussion of some of the seedlings grown in relation to various desirable characteristics of strawberry varieties.—*W. H. Chandler.*

1709. STEIN, EMMY. Zur Genetik der Gattung Salix. [The genetics of the genus Salix.] Zeitschr. Indukt. Abstamm.- u. Vererb. 37: 86–87. 1925.—The article is an addendum to the author's previous general review of the genetics of the genus Salix (Ibid. 34: 249) and is devoted to the work of BLACKBURN and HARRISON: "A preliminary account of the chromosomes and chromosome behavior in the Salicaceae." (See Bot. Absts. 14, Entry 3267.)—*R. E. Clausen.*

1710. SWINGLE, CHARLES F. Burr-knot of apple trees—its relation to crown gall and to vegetative propagation. Jour. Heredity 16: 313–320. 4 illus. 1925. (For abstract see this issue, Entry 1990.)

1711. TAKAHASHI, NOBORU. Inheritance of the spring versus winter form in barley. (Japanese.) Japanese Jour. Genetics 3: 22–28. 1 fig. 1924.—Winter barley, when sown in spring, shows overgrowth in culms and leaves, and as a rule is unable to form ears, while spring barley, when sown in autumn, is killed by winter cold. The cross between 2 forms gives in the  $F_1$  the spring form and in the  $F_2$  spring and winter forms in a 3:1 ratio. There are some forms of barley, which, when sown in spring, may grow like the normal spring form and yet, when sown in autumn, are able to withstand the winter cold ("intermediate" form). There are, on the other hand, some forms which, when sown in spring, do not produce ears and yet, when sown in autumn, are killed by winter cold (pseudo-winter form). All experiments were performed in Suwon (Corea).—*Author (Courtesy Japanese Jour. Bot.)*

1712. TSCHERMAK, ERICH. Ungewolte Frembestäubung bei sog. Selbstbäuern unter den Kulturpflanzen. [Accidental cross-pollination of so-called self-fertilized crops.] Wiener Landw. Zeitg. 75: 235–236, 243–244. 1925.—Even in crops considered to be normally self-fertilized it has been found that constant selection must be maintained to preserve the type. The conditions under which cross-pollination takes place in wheat, barley and oats are discussed. In general, high temperature and dry air, occurring in combination with adequate soil moisture, cause wider opening of the glumes and increase the opportunities for foreign pollination. The abundant production of natural hybrids between different species of wheat,

or between wheat and barley, etc., in certain years may be correlated with weather conditions at blooming time, or regional peculiarities in climate.—*F. Weiss.*

1713. TSE, YIN CH'EN. The genetics of two mutations in the fruit-fly, *Drosophila melanogaster*. China Jour. Sci. and Arts 2: 143-157. 6 fig. 1924.—Two recessive, sex-linked, mutant characters having an appearance like the previously known "yellow" and "extreme rudimentary," respectively, were each crossed with white, with bar, and with one another, to determine their loci. The percentages of recombination were as follows (total count on which percentage was based being given in parenthesis): *yw*, 2.5% (5908); *yr*, 46.2% (1951); *yB*, 47.1% (2287); *rw*, 43.1% (3805); *rB*, 2.3% (2644). These counts make it highly probable that these were recurrences or allelomorphs of the previously known mutants of similar appearance. The rudimentary showed considerable phenotypic variation, and apparently more abnormal forms appeared among the better nourished flies which hatched earlier. Twelve rudimentary females mated to non-rudimentary males laid an average of 30 eggs per mother (extremes 12 and 43) over a period of 10 days, of which only 4 per mother hatched into larvae and 2 became adults; as compared with 34 eggs per mother (extremes 20 and 47) laid by 16 rudimentary females mated to rudimentary males, of which none ever hatched; and 85 eggs laid by a non-rudimentary control mother in the same time, of which 83 became larvae and 82 adults. Rudimentary males by normal females were "fertile."—*H. J. Muller.*

1714. TURNER, C. L. Studies on the secondary sexual characters of cray-fishes. II. Females of *Cambarus virilis* with male secondary sexual characters. Biol. Bull. 48: 225-231. Fig. 1-2. 1925.—Of the females taken from Delavan Lake in southeastern Wisconsin, 88% bear ♂ secondary sexual characters in the form of copulatory hooks upon the 3rd walking legs. A small but constant proportion of other females of this species taken outside of Lake Delavan also bear these structures. The occurrence of ♂ secondary characters upon females has hitherto been reported as rare. No satisfactory explanation of the condition has been discovered, but a survey of the various possibilities indicates that the condition is not caused by environmental factors and that it is being inherited.—*Author.*

1715. TURNER, C. L. Studies of the secondary sexual characters of cray-fishes. III. Males with supernumerary male secondary sexual characters in the subgenus *Faxonius*. Biol. Bull. 48: 232-253. 1925.—In the genus *Cambarus*, the subgenus *Faxonius* is distinguished, along with 2 other subgenera, from the subgenus *Cambarus* by the possession in its males of a single pair of copulatory hooks upon the 3rd walking legs. In the subgenus *Cambarus* such hooks are present upon both the 3rd and the 4th walking legs. In collections from southern Wisconsin numerous specimens of males in the subgenus *Faxonius* have been discovered, which bore supernumerary hooks upon the 2nd or the 4th walking legs. These supernumerary hooks seem to be confined to the 2nd walking legs only in *Cambarus virilis*. The above mentioned specimens occur together with females bearing ♂ copulatory hooks upon the 3rd walking legs.—*Author.*

1716. UPHOF, J. C. TH. Breeding plants through hybridization. Florida Grower 25: 7. 1922.—A general description is presented as to the hybridization of plants which may be adapted to Florida conditions.—*Author.*

1717. UPHOF, J. C. TH. Die Farbenfaktoren von *Eschscholtzia mexicana* Greene. [The color factors in *Eschscholtzia mexicana* Greene.] Zeitschr. Indukt. Abstamm.- u. Vererb. 27: 227-229. 1922.—A number of different wild types of *Eschscholtzia mexicana* found in southern Arizona were examined as to the behavior of the flower color factors. In 2 different places far removed from each other, white flowering varieties were found, which probably originated independently. In crossing, they produced in the  $F_1$ , white flowering plants. Yellow flowering plants crossed with those having yellow petals with an orange colored base, produced in the  $F_1$ , yellow flowers with orange base; behaving like monohybrids. White flowering plants crossed with yellow gave similar results. Among the orange colored types, 2 forms were found and were called Orange I and Orange II. The former has an even orange color and when hybridized with white and with yellow flowering types behaved like a monohybrid. The latter is apparently the same, but when hybridized with yellow and white, the  $F_2$  produces a number of plants having yellow flowers with orange base and white flowers also with orange base. This orange base can not be observed in the pure Orange II.



The writer asks whether it will be of interest to examine from this standpoint the closely related *E. californica*, as to Orange I and II.—*Author*.

1718. VAVILOV, N. I., AND O. V. JAKUSHKINA. **A contribution to the phylogenesis of wheat and the inter-species hybridizations in wheats.** (Russian and English.) Труды по Прекладной Ботанике и Селекции. [Bull. Applied Bot. and Plantbreed.] 15: 3-159. 2 pl. 1925. —This paper deals with investigations on *Triticum persicum* Vav. cultivated in the mountain districts of Georgia and Armenia in numerous varieties. *T. persicum* (Persian wheat) is peculiar in its immunity to mildew (*Erysiphe graminis* D. C.), in its chromosome number (haploid 14), and in its baking and milling qualities. Crosses were made between this species and 13 other wheat species involving 49 varieties, both wild and cultivated, and also with *Secale* and *Aegilops*. Wheats of the 14-chromosome group (*T. durum*, *T. polonicum*, etc.) were easily crossed with *T. persicum*. The *T. vulgare* group gave  $F_1$  hybrids markedly sterile and crosses of *T. persicum* and *T. monococcum* gave a still higher degree of sterility, as was also true of crosses with *Secale* and *Aegilops*. Grains obtained from crosses with *T. vulgare* and *T. monococcum* were poor and but few germinated. The inheritance of various characters in *T. persicum* was investigated, such as thin rachis, long awn-like projections of the empty glumes, pubescent stem-nodes, solid straw, immunity to mildew (dominant multiple factor character), and color, wrinkledness and flintiness of the grain. Linkage occurs between black pigment and glume pubescence in one of the forms. Various new combination characters and disharmonious combinations are described. In general the hybridisation data lead to conclusions in agreement with Karl Sax and others, according to which all wheat species fall into 3 groups, as determined by their chromosome numbers, 21, 14, 7. Crosses are obtained easily within group limits. The 21-chromosome group and the 14-chromosome group cross reciprocally more readily than either of them cross with the 7-chromosome group. A new type of segregation in inter-species hybrids in which a few constant types are produced, the others expected not being realized, is found in *T. persicum*-*T. monococcum* crosses. "Wichura-type" and "Naudin-type" of segregation are discussed and explained. *T. persicum*, through hybridisation with the durum wheats, may bring great practical results, such as extending the northward limits of spring durum wheats, giving us earlier-maturing durums, less fastidious as to rich soil. Crosses of *T. persicum* with soft wheats produce largely sterile or almost sterile combinations. The origin and systematic position of *T. persicum*, its resistance and susceptibility to black, brown and yellow rusts, and to loose smut and bunt and its milling and baking qualities are discussed in detail.—*Orland E. White*.

1719. VERRET, J. A., Y. KUTSUNAL, U. K. DAS, RAYMOND CONANT, AND TWIGG SMITH. **A method of handling cane tassels for breeding work.** Internat. Sugar Jour. 27: 412-417. Fig. 1. 1925.—The authors have developed a system of handling cane tassels for breeding which "gives promise of being of tremendous help in the work of crossing and selfing cane varieties." This method consists in placing the cut end of the cane stock, with or without tassel, in a solution of sulphurous acid ( $SO_2$ ), where it will live in apparently normal condition for several weeks, requiring no attention other than to see that it does not grow beyond reach of the tassel to be pollinated. Care must be taken to see that the sulphurous-acid solution does not contain sulphuric acid; that the solution is of proper strength, 1 part to 2000 having been found most satisfactory; and that the tassel is placed in the solution immediately after cutting, or in water if cut some distance from headquarters. The procedure in the experiments is described in detail. The method is not regarded as perfected.—*Nellie E. Fealy*.

1720. VRIES, HUGO DE. **Die Mutabilität von *Oenothera Lamarckiana* gigas.** [The mutability of *Oenothera Lamarckiana* gigas.] Zeitschr. Indukt. Abstamm.- u. Vererb. 35: 197-237. Fig. 1-13. 1924.—Evening primroses with 21 chromosomes appear frequently in cultures of *O. Lamarckiana* or its mutants, and also after various crosses. The pollen of these *semi-gigas* forms is usually almost completely sterile, so that self-pollination can rarely be accomplished. But when pollen from other species is used, a great variety of forms appear in the progeny. These may be divided into primary and secondary types. Primary types repeat the earlier mutations from *Lamarckiana*, and have 14 or 15 chromosomes. Secondary forms resemble the primary ones but display a mixture of subordinate characters; they have mostly

16-20 chromosomes. The primary forms are divided into 7 groups, each group being considered as corresponding to one of the chromosomes in the haploid nucleus. The groups have been named after the commonest types in each group as follows: *lata*, *scintillans*, *cana*, *pallescens*, *liquida*, *spathulata* and *pulla*. The 1st 6 of these, and in addition the less frequent *albida*, *oblonga*, *auricula*, *candicans* and *hamata*, are described and figured. All of those described are constant or split in the same way in each generation. They are dimorphic and heterogamous and also are dominant, since they always appear in the 1st generation in appropriate crosses. A number of crosses in which these forms appeared are analyzed. *O. gigas* is compared with *semi-gigas* in respect to its mutability. In order to make the conditions comparable, *gigas* was bred as the egg-bearing parent to 14 chromosome forms, and the  $F_1$  in turn used as the ♀ parent in crosses with various species. *Gigas* was also used as the pollen parent. A number of such crosses are analyzed and the results compared with those obtained in the case of *semi-gigas*. The mutability of *semi-gigas* and *gigas* are found to be essentially the same, it being immaterial whether *gigas* be used as sperm- or egg-bearing parent. The progeny in both cases consists of primary and secondary types, and 7 groups of frequent mutant groups are found. Thus, a study of these species strengthens the conception that mutable factors are distributed throughout all 7 chromosomes.—*Ralph E. Cleland*.

1721. VRIES, HUGO DE, UND K. BOEDYN. Die Gruppierung der Mutaten von *Oenothera Lamarckiana*. [The grouping of the mutants of *Oenothera Lamarckiana*.] Ber. Deutsch. Bot. Ges. 42: 174-178. 1924.—The mutants from *O. Lamarckiana* can be divided into 2 groups. In the 1st, called the "central group," the distinguishing characters are largely recessive. Most of the members are deficiency mutations, while a few are atavistic in nature. Their factors are all thought to lie in 1 chromosome. The 2nd group includes for the most part dominant forms, which are only produced by individuals which themselves display these forms. The distinguishing factors are not borne singly but in complexes and alter the whole habit of the plants. Such mutations, while not as yet discovered in other organisms, are now known to be typical for the *Oenotheras*. The most important examples of such mutants are *lata*, *scintillans*, *cana*, *pallescens*, *liquida* and *spathulata*. These are dimorphic, splitting in each generation. They are all 15-chromosome forms, and a lethal factor in the pollen makes it impossible for their characteristics to be transmitted through the pollen. Closely related to *lata* and *scintillans* are series of other forms, while the other 4 are more isolated. The distinguishing factors for the latter 4 are thought to lie in 4 small chromosomes of the 7 in the haploid nucleus, those of the *lata* and *scintillans* series being found in 2 larger ones. Such mutations are due to doubling in the case of 1 chromosome. But in *semi-gigas*, with its 21 chromosomes ( $14 + 7 = 21$ ), doubling has taken place in all 7 chromosomes, so that 7 such mutations have occurred all at once. In the 7-factor complexes in *Lamarckiana*, pre-mutations have accumulated but have not been able to express themselves. In *semi-gigas*, all are changed, through doubling of the chromosomes, from the latent to the active state. The various mutations can be separated from one another in the progeny of *semi-gigas* when it is pollinated by suitable forms. The higher the chromosome number in resulting plants, the weaker they are in general. The mutations which appear have 15 or more chromosomes and can be divided into 7 groups, each of which is due to the doubling of at least 1 chromosome, this chromosome being a different one in the case of each of the types. The main types of mutations, therefore, can each be referred to a particular chromosome, and the mutated factors are distributed throughout all the chromosomes.—*R. E. Cleland*.

1722. W., H. H. Plant-hunters, growers and hybridists of the 19th century. South African Gard. 15: 153-159. 1925.—The article is an historical sketch of the discovery and importation to England of many of the now familiar flowering plants. The hybrids described are of the orchid family: *Cattleya Warneri*, a mauve and orange variety which has since become a useful seed parent; a cross between *Calanthe Furcata* and *C. Masuca* which was the 1st orchid raised from seed in England (1856); a cross between the *Cattleya* and the *Laelia* and of these again with *Brassavola* and *Sophranitis*; a cross between *Odontoglossum* and *Miltonia* giving the *Odontonias* and a cross between *Odontoglossum* and *Cochlidia* giving



the Odontioda. *Cypripedium Farrieanum* yielded many hybrids. Work in hybridising roses and other hardy plants was going on at the same time as that upon orchids.—*Mary Ellen Peck*.

1723. WATKINS, A. E. Genetic and cytological studies in wheat II. Jour. Genetics 15: 323-366. Fig. 1-27. 1925.—In partially sterile segregates resulting from a cross between *durum* (14 chromosomes) and *vulgare* (21 chromosomes) wheats, the chromosome behavior in the reduction divisions is the same in the megaspore mother cells as it is in microspore formation. Most of the morphologically perfect pollen grains from  $F_1$  plants do not germinate on  $F_1$  stigmas or stigmas of either parent. It is concluded that pollen grains with 14 or 21 chromosomes are most likely to function. The evidence suggests that only a single set of the extra 7 *vulgare* chromosomes are necessary to give the typical *vulgare* characters. Segregates with 14 chromosomes resemble the 14-chromosome parent while 21 chromosome segregates are of the *vulgare* type.—*K. Sax*.

1724. WILDER, H. H. Palm and sole studies. Biol. Bull. 49: 182-211. Fig. 1-27. 1925.—The author suggests that there is a strong correlation between the occurrence of the various patterns of the human palm and sole and the amount of use or wear which the parts receive during the customary activities of everyday life. On the raised areas of the palm or sole, which have the hardest use, the ridges are the largest and coarsest, patterns occur more frequently and the patterns show a greater percentage of whorls. Over the hollowed areas, which are thus shielded from contact with external objects, the ridges are the finest and least prominent, patterns are less likely to occur, and when they occur they are more likely to be vestigial (arches or loops). Probably none of the 23 patterns of the human hand and foot has undergone such a complete degeneration as to disappear altogether; yet in at least 3 places the primitive form (whorl) has not yet been found. These 3 areas are those of little contact, 2 being in the foot (thenar and hypothenar) and 1 in the hand (the 2nd interdigital). The author describes in detail a series of primitive patterns, some of them never reported before. The most primitive patterns have been found in members of the European-American race, whereas they are missing in Japanese and Chinese. The fact that the author was not able to find in Ainus, Negritos, African Pygmies, etc., patterns as primitive as those of the European-American race, is partly ascribed to the limited number of cases observed.—*Walter Landauer*.

1725. WOODWORTH, C. M. Fortuitous variation. Amer. Nat. 59: 375-379. 1925.—Several hundred plants of a soy bean variety analyzed individually were found to exhibit considerable variation in oil content. High and low selections gave progeny which proved that the differences were partly due to genetic and partly to non-genetic causes. The author discusses the significance of fortuitous variation in evolution.—*R. E. Clausen*.

## HORTICULTURE

F. C. BRADFORD, *Editor*

(See also in this issue Entries 1337, 1338, 1339, 1340, 1397, 1399, 1566, 1579, 1580, 1636, 1646, 1662, 1691, 1708, 2103, 2119, 2123)

1726. ANONYMOUS. Plans for Luther Burbank's experimental farm. Science 62: 238-239. 1925.—Stanford University is about to acquire and conduct the farm as the Luther Burbank horticultural unit of the university.—*C. J. Lyon*.

1727. ALLEN, W. J. Provision for pollination in the orchard. Agric. Gaz. New South Wales 36: 563. 1925.—A diagram for orchard planting is shown.—*L. R. Waldron*.

1728. BALLOU, F. H. Rejuvenation of the apple growing industry in southeastern Ohio. Trans. Indiana Hort. Soc. 1924: 81-94. 1925.

1729. BARKER, B. T. P., AND OTTO GROVE. Cider-making experiments with culinary and dessert apples. Univ. Bristol Ann. Rept. Agric. and Hort. Res. Sta. 1922: 93-97. 1922.—Studies of the juice of some dessert and culinary varieties as to specific gravity, acid and tannin content, and the rate of fermentation are reported, as well as results of cider making trials with market varieties. Most market apples contain too little sugar and tannin and too

much acid to make desirable cider, but this deficiency can be largely corrected by blending with the market apple cider certain proportions of cider from bitter sweet varieties. [See also Bot. Absts. 13, Entry 249.]-W. H. Chandler.

1730. BARKER, B. T. P., AND OTTO GROVE. Cold-process fruit preserves. Univ. Bristol Ann. Rept. Agric. and Hort. Res. Sta. 1923: 114-116. 1923.—Attempts were made to preserve fruit products with high sugar content and without heat, thus possibly retaining more of the fruit flavor and the accessory food factors such as vitamins. With jams they were unsuccessful. The jams separated into layers with the pulp at the top and the juice at the bottom. Fairly good jellies were made from extracted juices of currant fruit treated with sugar syrup without heat. Filtered juices from some crushed fruits that had been permitted to stand 4-5 days and ferment slightly kept well and retained high flavor when so treated as to obtain a saturated solution of sugar in the juice.—W. H. Chandler.

1731. BEACH, JOHN B. The avocado in Florida. Florida Fruits & Flowers 3<sup>2</sup>: 31, 43. 1925.—After discussing the food value of the avocado and the ways of using it, the author describes the characteristics of the West Indian, Guatemalan and Mexican types and reports the progress made in breeding, from these 3 types, of varieties adapted to conditions in both southern and northern Florida.—Arthur S. Rhoads.

1732. BOYNTON, K. R. *Aglaonema marantifolium*. Addisonia 9: 27. Pl. 302 (col.). 1924.—This is an ornamental herb of the family Araceae, native of Malaya. It is propagated by division or by cuttings and thrives in ordinary greenhouse compost.—T. J. Fitzpatrick.

1733. BOYNTON, K. R. *Begonia dregei*. Addisonia 10: 13. Pl. 327 (col.). 1925.—This begonia is a native of the Cape of Good Hope, South Africa, and was named for its discoverer, Jean François Drège. The species, though itself ornamental, is of interest chiefly as the parent of several beautiful varieties.—T. J. Fitzpatrick.

1734. BOYNTON, K. R. *Begonia sanguinea*. Addisonia 10: 7. Pl. 324 (col.). 1925.—This is an ornamental herb, native of South America, with a fibrous, perennial root-system, highly colored leaves, and white flowers in cymose clusters. It is propagated by cuttings and thrives in a greenhouse in fertilized, sandy loam.—T. J. Fitzpatrick.

1735. BOYNTON, K. R. *Helxine soleirolii*. Addisonia 9: 17-18. Pl. 297 (col.). 1924.—This creeping nettle is a native of Corsica and Sardinia, where it is found covering sea-washed rocks and banks. In cultivation it is very useful in covering small rockeries and bare spaces, from its habit of forming a rich green moss-like carpet. *Helxine* is a monotypic genus of the family Urticaceae.—T. J. Fitzpatrick.

1736. BOYNTON, K. R. *Pittosporum undulatum*. Addisonia 10: 9-10. Pl. 325 (col.). 1925.—This is a tree about 40 feet high, endemic to Australia. It may be grown from seed in a cool greenhouse, where it is a shrub or small tree. The flowers are ornamental and have a delicate, penetrating fragrance. Various trees of the genus find favorable conditions for growth in Florida and California.—T. J. Fitzpatrick.

1737. BOYNTON, K. R. *Primula sieboldii*. Addisonia 10: 5. Pl. 323 (col.). 1925.—This is a low herb, native to Japan, with a rosette of leaves, a flower scape bearing a highly ornamental, many-flowered umbel of rose colored flowers. The plant is hardy; it thrives best in rock gardens in well drained soil.—T. J. Fitzpatrick.

1738. BOYNTON, K. R. *Whitfieldia lateritia*. Addisonia 9: 43-44. Pl. 310 (col.). 1924.—This is a small shrub of the family Acanthaceae, native of tropical West Africa, first described by Hooker in 1845. In cultivation it occurs in greenhouses and conservatories, being propagated from seed.—T. J. Fitzpatrick.

1739. BOYNTON, K. R. *Zanthoxylum schinifolium*. Addisonia 10: 11. Pl. 326 (col.). 1925.—This is a small, spiny shrub, native of China and Japan, known as prickly-ash. It is readily propagated by seed. The fruit clusters are ornamental. The shrub is suitable for parks.—T. J. Fitzpatrick.

1740. BRITTON, N. L. *Acer rubrum*. Addisonia 9: 19-20. Pl. 298 (col.). 1924.—This highly useful tree is native to eastern North America, ranging far west into the Mississippi Valley. The flowers, foliage, and fruit are highly ornamental.—T. J. Fitzpatrick.

1741. BRITTON, N. L. *Asterandra grandifolia*. Addisonia 9: 41. Pl. 309 (col.). 1924.—This is a small tree of the Euphorbiaceae, native of Porto Rico, Cuba, Hispaniola,



Mexico, and northern South America. It has had a limited introduction into botanical gardens.—*T. J. Fitzpatrick.*

1742. BRITTON, N. L. *Barbieria pinnata*. *Addisonia* 10: 27. *Pl.* 334 (col.). 1925.—This is a monotypic genus, of the Fabaceae, established by A. P. de Candolle in 1825, in honor of J. B. G. Barbier. The species is a small shrub, known as *enredadera*, native to Porto Rico and other tropical American countries; it has conspicuous, highly ornamental flowers.—*T. J. Fitzpatrick.*

1743. BRITTON, N. L. *Barleria prionitis*. *Addisonia* 10: 17. *Pl.* 329 (col.). 1925.—This is a shrubby plant, 1-4 feet high, with ornamental, yellow flowers, native of tropical Asia and Africa, and a member of the Acanthaceae. It is easily cultivated in tropical flower-gardens whence it sometimes escapes to roadsides and waste places.—*T. J. Fitzpatrick.*

1744. BRITTON, N. L. *Byrsonima horneana*. *Addisonia* 10: 23. *Pl.* 332 (col.). 1925.—This is a small tree, up to 15 feet high, with red-tomentose twigs, and ornamental, densely racemose flowers; it is a native of western Porto Rico. The type locality is Guanajibo, the only locality known; it is associated there with *B. cuneata* and *B. ophitica*.—*T. J. Fitzpatrick.*

1745. BRITTON, N. L. *Chamaecrista mirabilis*. *Addisonia* 10: 29. *Pl.* 335 (col.). 1925.—This is a low, nearly prostrate shrub, with bright yellow flowers; it is a native of northern Porto Rico, and a member of the Caesalpiniaceae. In sandy areas it forms extensive, nearly pure societies.—*T. J. Fitzpatrick.*

1746. BRITTON, N. L. *Distictis lactiflora*. *Addisonia* 10: 31. *Pl.* 336 (col.). 1925.—The 3 species of *Distictis* (Bignoniaceae) are confined to the northern West Indies. *D. lactiflora*, known as *liana fragante*, inhabits the dry parts of Cuba, Hispaniola, Porto Rico, St. Croix and St. Thomas. On this species Martius established the genus. The other species are *D. gnaphalanthia* and *D. rhynchocarpa*. All are woody vines, with opposite leaves and conspicuously ornamental flowers.—*T. J. Fitzpatrick.*

1747. BRITTON, N. L. *Erythrina poeppigiana*. *Addisonia* 10: 21. *Pl.* 331 (col.). 1925.—This is a tree, 50-80 feet in height, known as *bucare*, native of Peru, and a member of the Fabaceae. It is an ornamental tree, especially when in bloom. It was introduced into the West Indian Islands, as a shade for coffee, where it has become naturalized and is abundant.—*T. J. Fitzpatrick.*

1748. BRITTON, N. L. *Tabebuia haemantha*. *Addisonia* 10: 25. *Pl.* 333 (col.). 1925.—This is a small tree, known as *roble colorado*, with showy flowers, endemic to Porto Rico, and a member of the Bignoniaceae. The genus comprises about 80 species, many of them West Indian or Brazilian. *Tabebuia* is closely related to *Tecoma*, in which many of the species have been included.—*T. J. Fitzpatrick.*

1749. BRITTON, E. G. *Unifolium canadense*. *Addisonia* 9: 25-26. *Pl.* 301 (col.). 1924.—This liliaceous plant is native to eastern U. S. A. and Canada. Another species occurs in western North America and eastern Asia and a 3rd is native of Europe. By some authorities all 3 are regarded as geographic forms of the same species. *U. canadense* forms a pleasing ground cover in moist shady woodlands.—*T. J. Fitzpatrick.*

1750. BRITTON, N. L. *Urena lobata*. *Addisonia* 10: 19. *Pl.* 330 (col.). 1925.—This is a tropical shrub of the old and new world, known as the *cadillo*; rather ornamental, and a member of the Malvaceae. The name *Urena* is Malabaric in origin, proposed by Dillenius, and confirmed by Linnaeus. Several species are recognized by some authorities, but others regard all as forms of a single species. It has possible economic value for fiber.—*T. J. Fitzpatrick.*

1751. BROWN, H. D. Growing tomatoes for the canning factory. *Purdue [Indiana] Agric. Exp. Sta. Bull.* 288. 1-27. *Fig.* 1-18. 1924.—The growing of stocky, disease-free tomato plants, ready for field planting by May 25, is one of the chief limiting factors in the production of canning factory tomatoes in Indiana. Such plants may be grown in Indiana by the use of glass or, in selected southern regions, without glass. Applications of 500-1500 pounds of a 2-12-6 fertilizer to most Indiana soils return an economic increase in yield. Acid phosphate alone increases the earliness of the crop. Manure free from diseased refuse should be used whenever possible. Detailed cultural directions are given. Descriptions of and control methods for the tomato diseases and insects of local importance are included.—*Author.*

1752. BROWN, W. H. The renovation of unprofitable citrus orchards. *Agric. Gaz. New South Wales* 36: 591-594. 1925.

1753. BUNTING, T. J. *Apple growing in the Province of Quebec.* Amer. Fruit Grower 45<sup>o</sup>: 8, 19. *Illus.* 1925.—The author gives a brief descriptive account of apple growing in Quebec, touching upon the antiquity of apple growing in this province; the Fameuse or Snow apple, which originated here; the McIntosh apple, which originated in East Ontario, about 50 miles from the Quebec boundary; location of the orchards; revival in the care of the orchards; and certain outstanding orchards within the province.—*Arthur S. Rhoads.*

1754. CHANDLER, W. H. *Results of some experiments in pruning fruit trees.* New York Agric. Exp. Sta. [Cornell] Bull. 415. 1-75. *Fig. 1-15.* 1923.—Pruning of fruit trees under 12 years old caused a temporary increase in vigor, with the greatest stimulation at the point where the cut had been made. Pruning is a dwarfing process which reduces leaf surface, root growth and the amount of fruit borne. Fruiting also dwarfs a tree and in a few years may offset the results produced by moderate pruning. In the peach, an age is reached when the annual cutting back increases the vigor of the tree and the size of the fruit. Summer pruning causes a decrease in fruiting and dwarfs the tree more than an equal amount of dormant pruning. During a short growing season, it may delay the maturity of the wood and thus render the tree unable to withstand low temperatures. With most varieties heavier crops were produced while the trees were young if the removal of the lower and undesirable branches was delayed until the trees were old enough to bear fruit heavily. The proper method of pruning apple, pear, quince, peach, plum and cherry is considered from the standpoint of the experimental evidence.—*W. O. Gloyer.*

1755. CULLINAN, F. P., and CLARENCE E. BAKER. *Pruning young apple trees.* Purdue [Indiana] Agric. Exp. Sta. Bull. 274. 1-40. *Fig. 1-12.* 1923.—Careful studies on the response of apple trees of the Grimes variety from planting time until 8 years in the orchard show that heavy pruning, that is, cutting back of annual growth and thinning out, on trees of this age has resulted in less total growth. The leaf surface also has been reduced. The results are based on weights of entire trees removed at the close of the 2nd, 3rd and 4th growing seasons and leaf areas based on leaf counts of total leaves on trees in the 3rd and 5th growing seasons. The lightly pruned trees began forming fruit buds early and came into bearing earlier than the more heavily pruned trees.—*Authors.*

1756. D., C. *Bush plants in a city garden.* Victoria Nat. 41: 193-199. 1925.—The appearance and time of blooming of various Australian plants are presented.—*Wm. Randolph Taylor.*

1757. DENSLOW, H. M. *Isotria verticillata.* Addisonia 9: 33, 34. *Pl. 305 (col.).* 1924.—This is an attractive orchid, native to eastern North America, first described by Willdenow as an *Arethusa* in 1805, referred to the genus *Isotria* by Rafinesque in 1808, and to *Pogonia* by Nuttall in 1818. It is a low perennial herb, thriving best in moist soil with good drainage in association with *Kalmia latifolia*, but it will grow under various conditions. A closely related form is frequently regarded as a distinct species, *I. affinis* (Austin) Rydb.—*T. J. Fitzpatrick.*

1758. DURST, C. E. *Rambles of a horticulturist.* Amer. Fruit Grower 45<sup>10</sup>: 5, 16. *Illus.* 1925.—This is a descriptive account of fruit-growing in North Carolina, treating of the various fruit-growing sections, preparation of the land for orchards, cropping methods in growing orchards, pruning methods, spraying program, varieties, marketing, annual peach show and apple growing in western North Carolina.—*Arthur S. Rhoads.*

1759. GARDNER, H. G. *Blackberries in Florida.* Citrus Indust. 6<sup>10</sup>: 8. *Illus.* 1925.—The possibilities of commercial blackberry culture in Florida, believed to have a great future, are described.—*Arthur S. Rhoads.*

1760. GLEASON, H. A. *Isotoma longiflora.* Addisonia 9: 21-22. *Pl. 299 (col.).* 1924.—The quedeec is a native of Jamaica and a member of the Lobeliaceae. The other 7 species of *Isotoma* are natives of Australia. The quedeec was first noted in Jamaica by Sloane and a century ago it was introduced into cultivation in England. It is very poisonous.—*T. J. Fitzpatrick.*

1761. GLEASON, H. A. *Monarda fistulosa.* Addisonia 9: 39-40. *Pl. 308 (col.).* 1924.—The wild bergamot, a perennial herb, is native of the eastern U. S. A. and Canada, and is closely related to *M. media*. It responds to cultivation under many varied conditions, producing large ornamental clumps.—*T. J. Fitzpatrick.*



1762. GLEASON, H. A. *Rudbeckia triloba*. *Addisonia* 9: 47-48. *Pl.* 312 (col.). 1924. —This is an ornamental, biennial herb, growing in moist woodlands and in open places from the Atlantic coast to Kansas, except New England. It has received a limited introduction.—*T. J. Fitzpatrick*.

1763. GROVE, OTTO. Cider-making trials for the season 1921-2. *Univ. Bristol Ann. Rept. Agric. and Hort. Res. Sta.* 1922: 103-107. 1922.—This paper contains notes and a table stating, for a considerable number of varieties, the date of pressing, specific gravity of the fresh juice, acid and tannin content, specific gravity of the finished cider, and date of requiring filtering as indicating the rate of fermentation. Results with a few mixtures of cider from several varieties are given and also the results with cider from a few varieties after pasteurizing and fermenting with pure yeast.—*W. H. Chandler*.

1764. GROVE, OTTO. Cider-making trials for the season 1922-1923. *Univ. Bristol Ann. Rept. Agric. and Hort. Res. Sta.* 1923: 108-113. 1923.—Besides reporting some unsuccessful tests of racking and keeing methods for the purpose of settling out the fermentation organisms and checking fermentation, this paper gives data on the composition of cider made from apples of different varieties and combinations of varieties. There is also a discussion of the quality of cider from some of the varieties and combinations.—*W. H. Chandler*.

1765. GROVE, OTTO. Cider storage experiments, 1923. *Univ. Bristol Ann. Rept. Agric. and Hort. Res. Sta.* 1923: 102-105. 1923.—When cider is held in containers that are not completely air tight there is gradual loss of specific gravity and a gradual development of acetic acid. In France this is prevented by storing in rather expensive glass lined cement tanks. The author treated some wooden casks with paraffin and others with varnish hoping to render them air tight and thus to prevent acetification. However, the results were not more satisfactory than those secured with ordinary wooden casks, and some of the treatments injured the flavor. Some preliminary experiments suggest that it may be possible to store cider without acetification or injury to flavor, in cement containers, the inner surface of which is treated with a hot paraffin resin wax.—*W. H. Chandler*.

1766. GROVE, OTTO. The composition of vintage apples in 1921. *Univ. Bristol Ann. Rept. Agric. and Hort. Res. Sta.* 1922: 98-102. 1922.—This paper includes a table of specific gravities and acid and tannin contents for a rather large number of varieties of apples from different sections of England.—*W. H. Chandler*.

1767. GROVE, O., AND T. WALLACE. Trial cider and perry orchards. *Univ. Bristol Ann. Rept. Agric. and Hort. Res. Sta.* 1922: 42-48. 1922.—This is a report of an inspection of the trial cider orchards in Worcestershire and Herefordshire during the autumn of 1921. The condition of the orchards and the behavior of the different varieties is stated, together with information concerning the geological formation and soil characteristics.—*W. H. Chandler*.

1768. GRUBB, N. H., AND G. S. PEREN. Raspberry nomenclature. *Univ. Bristol Ann. Rept. Agric. and Hort. Res. Sta.* 1922: 37-39. 1922.—This is a preliminary report on variety collections, at East Malling and Long Ashton, of commercial varieties as obtained from nurserymen. A list is given showing the different names given to the same variety and one showing the number of varieties sold under a given name. Thus Antwerp Red plants are sold under a number of different names and 8 different varieties are sold as Antwerp Red. With a number of other varieties the confusion in nomenclature is as great. [See also *Bot. Absts.* 13, Entry 225.]—*W. H. Chandler*.

1769. H., E. J. [Rev. of: LIPPMAN, EDMUND O. *Geschichte der Rübe (Beta) als Kulturpflanze von den ältesten Zeiten an bis zum Erscheinen von Achard's Hauptwerk (1809)*. [History of the beet as a cultivated plant from earliest time to the work of Achard.] *vi + 184 p.* Julius Springer: Berlin, 1925.] *Nature* 116: 93. 1925.

1770. HAWKINS, PAUL D. Comparative experiments with *Vitis vinifera* and American hybrid grapes in Florida. *Florida Fruits & Flowers* 3<sup>3</sup>: 55-56. 1925.—This is an account of the progress of the author's experiments in growing grafted grapes in Florida. For his own work he favors the growing, if possible, of pure viniferas or viniferas diluted with some of the hybrid blood or native grape blood to just such a point that they will show sufficient disease resistance to withstand Florida conditions with ordinary treatment. The following observa-

tions on disease resistance are based on vines 20 months old, many of which have fruited. The author found that some individual viniferas were as immune to anthracnose as any individuals of the hybrids, that many were as resistant as the average hybrid and that most were as resistant as Ellen Scott and Armalaga. In resistance to rot he found that the viniferas ranked slightly lower than the hybrids, but many of the unsprayed viniferas showed no indication whatever of any rot. To downy mildew, he found lower resistance in the viniferas; however, some were almost immune. Several of the unsprayed viniferas showed no disease at all. The author has found no evidence of phylloxera on the vinifera grapes, although crown gall has been found.—*Arthur S. Rhoads.*

1771. HOARE, A. H. The cultivation of cherries. Jour. Ministry Agric. Great Britain 31: 271-278, 360-363. 1924.—General suggestions are offered on the growing of both sweet and sour cherries, including suitable soils, propagation, planting, varieties, pruning, management, picking and marketing, and diseases and pests.—*M. B. McKay.*

1772. HOBBS, C. M. Doctor Mathews apple. Trans. Indiana Hort. Soc. 1924: 164. 1925.—The history and a description of this variety are given.—*M. W. Gardner.*

1773. JANSON, A. Das Treiben des Rhabarbers. [Forcing rhubarb.] Gartenwelt 28: 22-23. 1924.—The forcing of rhubarb is much practised near Hamburg. Any variety may be used but Queen Victoria and Amerikanischer Riesen are especially suitable. The former is 10-12 days earlier than the latter. Before January 25, rhubarb does not force well; the petioles remain short. The healthier the clumps and the less the root system is damaged the better are the results obtained. They are planted close and grown under the benches in the greenhouse.—*J. C. Th. Uphof.*

1774. JOHNSTON, EARL S. Sand culture studies check with practical experience. Potato News Bull. 2: 365-366. 1925.—Experience has shown the suitability of a 7-6-5 fertilizer mixture for early potatoes on the sandy soil of eastern Maryland. The proportions between the elements N, P, and K in such a mixture are 44:21:33. In quartz sand cultures to which the mineral nutrients were added in solution, best growth of potatoes occurred with the proportions 44:22:33, showing agreement between laboratory and field methods.—*F. Weiss.*

1775. LANHAM, W. B. Texas Magnolia figs. Amer. Fruit Grower 45<sup>o</sup>: 8, 26. *Illus.* 1925.—After giving an account of the development of the Magnolia fig industry in Texas, the author discusses the culture of this fruit in that state with reference to selection of site, cultivation, and spraying to control fig rust, the only disease that seriously affects figs in Texas. At present the market demand for this fruit, which is sold preserved in heavy syrup, is said to exceed the demand.—*Arthur S. Rhoads.*

1776. LORD, E. L. Factors in the production of quantity and quality of citrus fruits. Florida Fruits & Flowers 3<sup>o</sup>: 53-54, 66. 1925.—The factors involved in the production of quantity in citrus fruit are discussed as external and internal. Those involved in the production of quality in citrus fruits are reserved for a future paper.—*Arthur S. Rhoads.*

1777. LOUCKS, KENNETH W. Asters, how to grow them. Florida Fruits & Flowers 3<sup>o</sup>: 44-45; 3<sup>o</sup>: 64. 1925.—This is a general account of the growing of China asters in Florida, including varieties, diseases, propagation, soils, fertilization and general care.—*Arthur S. Rhoads.*

1778. LUCKETT, J. D. Quince deserves more attention. Amer. Fruit Grower 45<sup>10</sup>: 10, 12, 21. *Illus.* 1925.—After emphasizing the desirability of devoting more attention to the quince, the author discusses the methods of propagation, soil preferences, important varieties and uses of the quince.—*Arthur S. Rhoads.*

1779. MACDANIELS, L. H. The apple tree crotch: histological studies and practical considerations. New York [Cornell] Agric. Exp. Sta. Bull. 419. 3-22. *Pl. 1-2, fig. 1-13.* 1923.—The inherent weakness of the crotches of the apple varieties is correlated with the angle between the crotch arms. The breaking strength varied from 56 to 107 pounds for crotches whose angles varied from 30 to 75 degrees, respectively. Crotch weakness is most apparent as the trees come into bearing but with age the tissues tend to knit firmly. Sections show that tissues at the crotches differ from the normal in that there is present more parenchyma, larger medullary rays and fewer wood fibers and vessels. The specific gravity of oven-dried crotch tissue was determined by water displacement and found to be 0.67 as compared to 0.58 for



normal heartwood. The high nitrogen content of crotch tissue is suggested as a possible cause of the susceptibility to winter injury. Bracing of branches is desirable on young trees and the methods of bracing are described.—*W. O. Gloyer*.

1780. MAEKAWA, TOKUJIRO. The flowering habit of *Chrysanthemum littorale* Maekawa, its vegetative propagation as an adaptation, the fluctuation of the number of ligulate flowers, and the cultivated races derived from it. (Japanese.) Jour. Agric. Forest. Soc. Sapporo 14: 1-16. 1 pl., 4 fig. 1923; 16: 61-86. 2 pl., 7 fig. 1924.—*Chrysanthemum Gmelini* (Ledeb.) Miyake & Miyake, which was first described and illustrated by Gmelin, must be considered as a species quite distinct from *C. arcticum* L., though the 2 are sometimes confounded. In Kurile Island there occur not only these 2 species, but also a variety of the latter—var. *yezoense* of the author. Descriptions of the *Chrysanthemum* spp. in Saghalien, Hokkaidô and Northern Nippon are given, namely, *C. yezoense* Maekawa, including 3 varieties, *typicum*, *stipulatum* and *lobulifolium*, *C. arcticum* L., *C. Gmelini* (Ledeb.) Miyabe & Miyake, *C. littorale* Maekawa and *C. Weyrichii* Miyabe & Miyake.—*C. littorale* grows in limited portions of Hokkaidô. Plants produced from seed may bear flowers only in their 2nd or 3rd year, and many of them are destined to die, while, on the contrary, in those derived from the stolons and rhizomes the death rate is considerably lower. The latter mode of reproduction is to be considered as a very efficient biological adaptation; since plants grow near the sea shore, and consequently are exposed not only to violent wind, but also sometimes to the attack of sea waves, reproduction by seed would not be a very safe way of assuring their existence.—The statistical study of the number of ligulate flowers of this species has shown that its variation follows generally Fibonacci's series with its mode at 21. The author has found a special colony of this species growing wild at a certain locality, and observed that here the mode lies at 34; the fact is very interesting, inasmuch as it resembles somewhat the well-known selection experiment of de Vries on *C. segetum plenum*.—Under cultivation this species produces flowers in the 2nd year. It branches very richly, and accordingly a large number of heads is produced, adding greatly to its beauty. The following observations made on cultivated plants are to be noticed: The number of heads is greatest in the uppermost secondary branches, gradually diminishes downward, and again increases somewhat toward the lowermost. The average number of ligulate flowers for each head is greatest in the upper part of the stem, and decreases gradually downwards. In the head at the apex of branches of any order the number of ligulate flowers is nearly constant.—The author recommends *C. littorale* as an ornamental plant, especially because it produces a large number of beautiful heads.—*Author (Courtesy Japanese Jour. Bot.)*.

1781. MASON, C. R. The mushroom industry of Pennsylvania. Pennsylvania Dept. Agric. Gen. Bull. 392. 1-28. 9 fig. 1924.—Pennsylvania produces 85% of the mushrooms (*Agaricus campestris*) grown in the U. S. A. A popular account of the industry is presented, followed by instructions for producing the crop on a commercial scale.—*H. W. Thurston, Jr.*

1782. MASON, C. R. The Pennsylvania vegetable forcing industry. Pennsylvania Dept. Agric. Gen. Bull. 396. 1-52. 18 fig. 1924.—Vegetable forcing is increasing in Pennsylvania. A recent survey shows over 40 acres covered by commercial vegetable greenhouses. The principal crops for forcing are lettuce, tomatoes and cucumbers, while others mentioned are beets, celery, dandelion, French endive, melons, radishes, rhubarb, green onions, parsley and New Zealand spinach. Frame forcing, greenhouse construction and arrangement, beds versus benches, greenhouse soils, fertilizers, soil sterilization, irrigation devices and insects and diseases are discussed.—*H. W. Thurston, Jr.*

1783. MORRIS, ALBERT. Strawberries for the home and market. Trans. Indiana Hort. Soc. 1923: 48-53. 1924.

1784. MOWRY, HAROLD. Some observations on grapes at the Experiment Station. Florida Fruits & Flowers 3: 40. 1925.—This is a report on the behavior of 44 varieties of bunch grapes, mostly Munson hybrids, planted on the Experiment Station grounds at Gainesville, Florida, in January, 1923. The soil type is Norfolk sand. The methods employed in planting, trellising, fertilizing, and spraying the vineyard are described and the varieties in the test classified according to growth on the basis of vigorous, fair and weak. The author believes that grape varieties vary in vigor of growth on different soil types and that this classification

would not hold for these varieties on other soil types. In conclusion, a list of the varieties which have been found to be attacked by powdery mildew, downy mildew, black rot, rust, and phylloxera is given.—*Arthur S. Rhoads.*

1785. MUSSER, A. M., AND W. J. YOUNG. Lettuce varieties. South Carolina Agric. Exp. Sta. Bull. 215. 1-16. 4 fig. 1922.—This is a description of several varieties of lettuce, based on their behavior in a test on clay soil in the Piedmont section of South Carolina, together with recommendations of varieties for planting in that section.—*C. A. Ludwig.*

1786. NORTON, L. J. An economic study of the production of canning crops in New York. New York Agric. Exp. Sta. [Cornell] Bull. 412. 3-82. Fig. 1-6. 1922.

1787. ODELL, FRANK I. Hardiness of peach varieties. Trans. Indiana Hort. Soc. 1924: 167-168. 1925.—The percentage of a full crop in 1924 on each of 25 varieties is presented.—*M. W. Gardner.*

1788. OLSON, GEORGE A. Fruit trees and fertilizers. Citrus Indust. 6<sup>o</sup>: 14. 1925.—This is a general discussion of the concentration of the plant nutrient solution in relation to growth of fruit trees.—*Arthur S. Rhoads.*

1789. PECKHAM, E. A. S. *Puschkinia scilloides*. Addisonia 10: 3-4. Pl. 322 (col.). 1925.—The striped squill is a liliaceous herb, native to Asia Minor and the Caucasus. The plant is ornamental, of easy culture, grows best in a sandy loam soil, and may be propagated from bulbs, offsets, or seed.—*T. J. Fitzpatrick.*

1790. PEREN, G. S. Data on the lateral spread of the roots of fruit trees. Univ. Bristol Ann. Rept. Agric. and Hort. Res. Sta. 1923: 62-68. Fig. 1a-8. 1923.—This is a continuation of work reported in 1921. The measurements indicate that there must be much overlapping of roots in standard and dwarf orchards with the trees at the planting distances commonly used and that, in the climate of that section of England, with the subsoils rather poorly aerated, the greater part of the root systems of apples, cherries and plums are within 2 feet of the surface of the soil.—*W. H. Chandler.*

1791. ROBERTS, R. H. Variation in growth of nursery grafts. Science 62: 356. 1925.—The best growth is obtained if the top bud of the scion is placed directly above the point of union. This was demonstrated by studies of a large number of cases of apple grafts.—*C. J. Lyon.*

1792. ROEBUCK, W. S. Experience in vegetable growing with irrigation. Trans. Indiana Hort. Soc. 1923: 42-47. 1924.

1793. ROSE, J. N. *Graptopetalum rusbyi*. Addisonia 9: 31-32. Pl. 304 (col.). 1924.—This stonecrop is a member of the Crassulaceae and was described in 1883 by E. L. Greene as *Cotyledon rusbyi*. It is an ornamental, stemless herb, found rarely in the Santa Catalina Mountains of Arizona.—*T. J. Fitzpatrick.*

1794. RYDBERG, P. A. *Erythronium grandiflorum*. Addisonia 9: 23-24. Pl. 300 (col.). 1924.—This ornamental species is closely related to *E. americanum* and is native to the region of the northern Rocky Mountains. It was discovered by Captain Meriwether Lewis along the Clear Water River in Idaho and was named and described by Pursh. It grows in rich soil on open hillsides, where there is plenty of humus.—*T. J. Fitzpatrick.*

1795. SCHUSTER, C. E. Pushing the walnut north. Amer. Fruit Grower 45<sup>10</sup>: 8, 37. Illus. 1925.—After a brief discussion of the beginnings of walnut growing on the Pacific Coast, the origin of the English walnut, the status of walnut growing in California and the northern progress of walnut culture until it has been demonstrated that walnuts can be grown successfully in Oregon, with some planted in Washington, the author takes up the location of walnut orchards, the soil requirements of walnut trees, and the experiences of some of the growers.—*Arthur S. Rhoads.*

1796. SCOTT, W. A. Growing walnuts in California. Amer. Fruit Grower 45<sup>10</sup>: 10, 12. Illus. 1925.—This is a description of commercial walnut growing in the vicinity of Linden, near Stockton, including methods of planting, irrigation, harvesting, hulling and curing the nuts, and grading and spraying methods.—*Arthur S. Rhoads.*

1797. SMALL, J. K. *Breynia nivosa*. Addisonia 9: 29-30. Pl. 303 (col.). 1924.—The snow-bush is a native of the New Hebrides and a member of the Euphorbiaceae. It is usable for hedges, borders, and mass plantings. It does well in sandy soil or in humus. It is easily



grown and may be propagated by cuttings. The foliage is highly ornamental.—*T. J. Fitzpatrick*.

1798. SMALL, J. K. *Dionaea muscipula*. *Addisonia* 10: 1-2. *Pl. 321 (col.)*. 1925.—The flytrap is a native of the coastal regions of North and South Carolina, occurring in bogs and open pinelands. It was discovered by John Bartram at least as early as 1765 and soon sent to England. It belongs to a vanishing type of vegetation.—*T. J. Fitzpatrick*.

1799. SMALL, J. K. *Iris carolina*. *Addisonia* 9: 49-50. *Pl. 313 (col.)*. 1924.—This ornamental species is native of the southeastern U. S. A. and is common especially in the coastal plain. It is closely related to *Iris versicolor*. It thrives best in black silt loam with stale water and partial shade. Plants are readily propagated from seed.—*T. J. Fitzpatrick*.

1800. SMALL, J. K. *Iris cristata*. *Addisonia* 9: 63-64. *Pl. 320 (col.)*. 1924.—This is a small flowered dwarf iris, native of southeastern U. S. A. where it is widely distributed. Its habitat varies exceedingly and consequently it is easily cultivated. It was introduced into England by Peter Collinson in 1756.—*T. J. Fitzpatrick*.

1801. SMALL, J. K. *Iris foliosa*. *Addisonia* 9: 53-54. *Pl. 315 (col.)*. 1924.—This species is a native of the lower Mississippi Valley. It was proposed as a species in 1902, the type locality being Little Blue Tank, Jackson County, Missouri, collected June 6, 1897. The plant grows in dense colonies in open woods and on prairies and is hardy in cultivation in latitudes far north of its natural range.—*T. J. Fitzpatrick*.

1802. SMALL, J. K. *Iris hexagona*. *Addisonia* 9: 51-52. *Pl. 214 (col.)*. 1924.—A robust, ornamental species, native to the southern Atlantic and Gulf coast strip of the southeastern U. S. A. It thrives best in black silt loam in shallow streams and swamps. It is a comparatively late bloomer and the flowers persist for several days.—*T. J. Fitzpatrick*.

1803. SMALL, J. K. *Iris lacustris*. *Addisonia* 9: 61-62. *Pl. 319 (col.)*. 1924.—This is one of the smaller flowered ornamental species, native of central North America, in the region of the Great Lakes, first described by Nuttall. It is closely related to *Iris cristata*, from which it is separated by differential morphological characters and an isolated geographic range. It is easily cultivated far out of its natural range.—*T. J. Fitzpatrick*.

1804. SMALL, J. K. *Iris versicolor*. *Addisonia* 9: 55-56. *Pl. 316 (col.)*. 1924.—This species is widely distributed over eastern North America and was the first of the American species to be described. It apparently originated in the Appalachian Highlands and since the ice age it has spread widely, giving rise to various species. It is ornamental and easily cultivated, preferably on moist soil containing much humus.—*T. J. Fitzpatrick*.

1805. SOUTHWICK, E. B. *Nierembergia rivularis*. *Addisonia* 9: 37. *Pl. 307 (col.)*. 1924.—The white-cup belongs to the Solanaceae and is a native of Argentina. It was named by Miers in 1846 in honor of Nieremberg, author of a history of nature published in 1685. It was introduced from La Plata in 1866. It is a hardy, low perennial bearing ornamental white flowers with pale yellow centers, blooming from June until October. It is easily propagated from cuttings.—*T. J. Fitzpatrick*.

1806. STOKES, W. B. Storage of lemons. Some further tests. *Agric. Gaz. New South Wales* 36: 671-674. 1925.—The various subjects discussed are handling the fruit, place of storage, period of test, and temperatures and humidities.—*L. R. Waldron*.

1807. SUMMERS, F. Factors governing fruit-bud formation. V. Further experiments upon ringing and notching of fruit trees. *Univ. Bristol Ann. Rept. Agric. and Hort. Res. Sta.* 1922: 27-31. 1922.—Pruned and unpruned twigs of the apple, pear and cherry were ringed March 15 and 16 (before the beginning of growth), some close to the top of a bud, some close to the base of a bud and some midway between 2 buds. The cambium was left and the wounds generally healed. Growth was generally stimulated in the buds nearest below the ring and retarded in the buds above the ring. In unpruned twigs containing a terminal bud, the growth from that bud was always more rapid than growth from the dominant bud below the ring; in pruned twigs from which the terminal bud had been removed, growth from the bud nearest below the ring was often more vigorous than growth from the most distal bud above the ring. After the ringing wound was covered with new bark, however, growth from buds above the ring became the more rapid. Notching seemed to influence the growth from a bud only for a very brief period.—*W. H. Chandler*.

1808. WALLACE, T. **Pot experiments on the manuring of fruit trees. II.** Univ. Bristol Ann. Rept. Agric. and Hort. Res. Sta. 1922: 11-26. 1922.—This reports a continuation of the experiment (see Bot. Absts. 13, Entry 5379) with strawberries and Cox Orange apples. In addition, experiments were conducted with gooseberries and black currants. The plants were grown in silver sand in unglazed pots, some of the plants being watered with a complete nutrient solution and some with a solution from which an essential element was omitted. Though no apples made satisfactory growth, those watered with rain water only, with a solution from which N was omitted, and with a solution from which P was omitted seemed to be least satisfactory in behavior. The omission of K caused serious leaf scorch. With gooseberries and currants the omission of N caused the most striking injury; but the omission of P or K seemed to cause some injury. With strawberry plants the omission of N seemed but slightly more injurious than the omission of P; the omission of K seemed but slightly injurious and the omission of Ca and Mg did not seem to be injurious.—*W. H. Chandler.*

1809. WALLACE, T. **Pot experiments on the manuring of fruit trees. III.** Univ. Bristol Ann. Rept. Agric. and Hort. Res. Sta. 1923: 43-57. 1923.—This is a report of work done and observations made during the season of 1923, continuing work described in the reports of 1921 and 1922. There are descriptions of the behavior of apple, gooseberry, currant, strawberry and raspberry plants. The omission of phosphorus from plants growing in sand did not seem to reduce growth during the first half of the first season when the reserve P of the plant had not been exhausted, but later the foliage began to show bronze or purple tints and fell prematurely, the growth being very weak in succeeding years. Omission of N was injurious from the beginning. Omission of K checked growth slightly less than the omission of N or P and did not cause as early a leaf fall but it always caused serious leaf scorch early in the season. The omission of Ca caused the foliage to have an unhealthy appearance but did not reduce root or top growth as much as did the omission of N, K or P. The omission of magnesium seemed to cause early leaf fall and to cause injury to some of the roots; but it did not reduce root or top growth as much as did the omission of the other elements. In 1923 some special studies with apple trees were started to learn the effect of altering the N:K ratio on the amount of leaf scorch. Reducing the amount of N or increasing the amount of K in the nutrient solution reduced the amount of leaf scorch, increasing the amount of K being more effective than reducing the amount of N. Reducing the amount of N in the nutrient solution was effective in reducing the amount of leaf scorch, and increasing the amount of K was effective in preventing leaf scorch even when sodium silicate, which increased leaf scorch, was added to the nutrient solution.—*W. H. Chandler.*

1810. WILTSHIRE, S. P. **Wound dressings.** Univ. Bristol Ann. Rept. Agric. and Hort. Res. Sta. 1922: 40-41. 1922.—This is a preliminary report on a trial of a considerable number of wound dressings. Some attention is given also to the effect on wound healing of cutting at different seasons and of different types of cuts.—*W. H. Chandler.*

## MORPHOLOGY, ANATOMY AND HISTOLOGY OF VASCULAR PLANTS

A. J. EAMES, *Editor*

(See also in this issue Entries 1382, 1434, 1481, 1487, 1509, 1565, 1645, 1779, 1883, 1890, 1891, 1906, 1908, 1913, 1914, 1915, 1969, 2039, 2055, 2056, 2108, 2154)

1811. ANONYMOUS. [Rev. of: HABERLANDT, G. *Physiologische Pflanzenanatomie. (Physiological plant anatomy.)* 6th ed. xvii + 671 p. Wilhelm Engelmann: Leipzig, 1924 (see Bot. Absts. 10, Entry 1190).] *Nature* 116: 169. 1925.

1812. BERGMAN, H. F. **An unusual intraovarial fruit in *Carica papaya*.** Bot. Gaz. 79: 222-223. *Fig. 1.* 1925.—This describes a secondary fruit within the ovary which proved to be a proliferation of the stem axis. The seed cavity contained ovule incepts but no seeds, the normal seeds being present in the enclosing ovary.—*B. W. Wells.*

1813. CARPENTER, C. C. **Apple tufts.** Bot. Gaz. 78: 414-423. *Fig. 1-6.* 1924.—Apple tufts or the white growth seen on carpel walls and seed of some varieties of apple were found not to be of fungus origin but to originate from the apple tissue. No correlation of tufts



with open core, open calyx, or abortive seed, was found. A correlation was found, however, with relation to decay; apples containing tufts would store for long periods.—*B. W. Wells.*

1814. CHIARUGI, A. *Embriologia delle "Cistaceae."* [Embryology of the "Cistaceae."] *Nuovo Gior. Bot. Italiano* N.S. 32: 223-316. Pl. 9-14. 1925.—The author studies the embryology of the European genera of the Cistaceae, unknown up to now, extending the research to 12 species. A unicellular archesporium is found in *Cistus*, *Tuberaria*, *Fumana* and in the section *Brachypetalum* of *Helianthemum*; a multiple archesporium in *Halimium* and *Helianthemum*. The phases of meiosis are studied in *Tuberaria guttata* (L.) Gross., and it is found that the formation of "gemini" takes place according to the metasyntetic plan of Farmer-Moore. The haploid number of chromosomes is established in all the species studied: 9 in *Cistus salviifolius* L., *C. monspeliensis* L., *C. laurifolius* L., *C. villosus* L., and in *Halimium halimifolium* Willk.; the polyploid series 8:16:24 is found in the other species: 8 in *Helianthemum ledifolium* Mill., 16 in *H. appeninum* Mill., *H. Chamaecistus* L. and *H. alpestre* Dun.; 16 in *Fumana arabica* Spach., and *F. procumbens* (Gren.) Godr.; 24 in *Tuberaria guttata* Gross. The fact is established that in the species with such a polyploid series, the volume of the chromosomes is constant whereas the volume of the nuclei increases in proportion to the number of chromosomes. The tetrad spore formation is normal and the development of the gametophyte takes place according to the unimegasporial octonucleate scheme. The antipodals disintegrate quickly; the synergids possess a filamentous apparatus. Double fertilization was observed in *Halimium halimifolium*, *Tuberaria guttata* and *Helianthemum alpestre*. The development of the embryo in *Helianthemum appeninum* was studied and it was found that this takes place as in the *Solanaceae* and as in the *Linaceae*: the terminal cell of the two-celled embryo is divided by means of a transverse wall; following this the formation of a true hypophysis takes place. With progress in the study of comparative embryology and with the knowledge of new types of development, the term "embryonic cell" has lost all value, and it must be recognized that the term "proembryo" also has little reason for existence. Finally, the author examines the contribution that embryology and cytology bring to the classification of the genera of the Cistaceae. On the basis of the chromosome number and the character of the archesporium, he recognizes as well established the genera *Cistus*, *Halimium*, *Tuberaria*, *Helianthemum* and *Fumana* and proposes the formation of the new genus *Aphananthemum* (Spach) Chiarugi to include the species of the section *Brachypetalum* of the genus *Helianthemum*.—*Author (translated).*

1815. COLLINS, G. N. The prophyllum of grasses. *Bot. Gaz.* 78: 353. Fig. 1. 1924.—This paper takes exception to Mrs. Arber's conclusions that the prophyllum of grasses represents a single leaf. Inequality of the 2 bundles, the position of the larger, and the displacement of the bundle by mechanical pressure need not indicate that both bundles belong to a single leaf, while the not infrequent formation of 2 functional buds in the axil of the prophyllum in certain types of maize and teosinte, and the fusion of adjacent leaves would suggest that the prophyllum might represent 2 leaves.—*C. F. Williams.*

1816. GOLA, G. Sulla membrana dei tessuti fellogenici della radici di *Diospyros Lotus* L. [The cell walls of the phellogenetic tissues in the roots of *Diospyros Lotus*.] *Boll. Soc. Bot. Italiana* 1924<sup>6</sup>: 125-130. 1924.—The cell walls of the phellogenetic tissues in the roots of *Diospyros Lotus* have a carbonaceous appearance and consistency which is more marked in the superficial strata than in the deeper ones. This is caused by a progressive "humification" of the cell walls. The humification does not take place at the expense of the cellulose, which may be found unaltered if the humic compounds are removed by proper chemical treatment, but at the expense of substances associated with cellulose and probably combined with it to form the cell wall (hemicelluloses, pectic substances, etc.). This process, therefore, is analogous to that observed in the humification of the plant cell walls during the formation of lignin.—*Author (translated).*

1817. HYDE, KARL C. Tropical light weight woods. *Bot. Gaz.* 79: 380-411. Pl. 26-28. 1925.—The locality and habit of growth, gross anatomy and minute anatomy of the following woods are described: *Heliocarpus popayanensis*, *H. appendiculatus*, *Pachira barrigon*, *Cavanillesia platanifolia*, *Wercklea insignis*, and *Cordia heterophylla*. Of the 2 types, homogeneous and laminated, histological evidence indicates the former to furnish better insulation ma-

terial. "Quipo" (*Cavanillesia platanifolia*) is stated to be the lightest wood known.—B. W. Wells.

1818. MARSHALL, CORNELIA C. Differentiation of sporangia in *Marsilea*. Bot. Gaz. 79: 85-94. Fig. 1-9. 1925.—The microsporangia and megasporangia of *Marsilea* are derived from sister cells. The megaspore mother cell shows a pair of large chromosomes which may be sex chromosomes. Since *Marsilea* is a monoecious plant, sex differentiation must have occurred in some somatic mitosis. In each of the 6 genera of heterosporous Pteridophytes the difference in the sporangia becomes visible at a different stage.—A. J. Eames.

1819. PISEK, ARTHUR. Antherentwicklung und meiotische Teilung bei der Wacholdermistel (*Arceuthobium oxycedri* (DC.) M. B.); Antherenbau und Chromosomenzahlen von *Loranthus europaeus* Jacq. [Anther development and meiotic division in the mistletoe (*A. oxycedri*) and anther structure and chromosome number of *L. europaeus*. Sitzungsber. Akad. Wiss. Wien. (Math.-Nat. Kl.) Abt. I. 133: 1-15. 1 pl., 3 fig. 1924.—The anthers of *Arceuthobium* lack an endothecium, and dehiscence is effected by the epidermis. The sporogenous tissue develops from the first as a closed ring about a central core of sterile tissue; it does not originate from the fusion of a divided archesporial complex and cannot be related to the tetrasporangiate type. It is rather to be considered as reduced to a single microsporangium, and the columella corresponds to the strands of sterile tissue found in certain other angiospermous types. The meiotic divisions show certain irregularities, presumably a consequence of unfavorable nutrition afforded by the host. These consist of failure of homologous chromosomes to pair, or loss of the paired relationship before the nuclear-plate stage, so that irregularities in the chromosome make-up of the tetrads occur. As a result, particularly toward the end of flowering, numerous aborted microspores are found. The normal diploid and haploid chromosome numbers are believed to be 26 and 13. No evidence of sexual dimorphism in chromosome configuration was found.—In the anther of *Loranthus* a small-celled epidermis completely encircles the fibrous layer composed of large, radially extended cells. The loculi originate separately from archesporia, and do not undergo secondary division. The chromosome numbers in the diploid and haploid phases are respectively 18 and 9, but material at hand was insufficient for a detailed study of meiosis.—*Arceuthobium* forms tannin and albumen abundantly in the peripheral layers of the floral bracts and the vegetative apices. The pollen adheres in masses. The formation of slime is considered a xerophytic adaptation, and it resembles the content of so-called albuminous cells in the bast of *Juniperus* shoots when penetrated by *Arceuthobium*.—F. Weiss.

1820. QUISUMBING, E. Stony layer in seeds of gymnosperms. Bot. Gaz. 79: 121-195. Pl. 11, fig. 1-88. 1925.—This paper gives a fairly complete account of the origin and development of the stony layer in the seed of *Lagenstroma*, some species of *Cycas*, *Ginkgo*, *Pinus*, *Juniperus*, *Torreya*, and *Gnetum*, and also, briefly, of a few angiosperms. It has a discussion of the homologies of the stony layer in the different groups, the use of the stony layer in interpreting the nature of the integument, and the problem of the chemistry of lignification of the stone cells. This stony layer is integumental in origin in the gymnosperms, and carpellary in the angiosperms studied. It apparently has phylogenetic significance in the gymnosperms, and further study in the angiosperms might determine relationships. Stony layers are either simple or complex. Morphological data may aid in determining the nature of lignification.—C. F. Williams.

1821. SCHNARF, KARL. Bemerkungen zur Stellung der Gattung *Saurauia* im System. [Notes on the systematic position of the genus *Saurauia*.] Sitzungsber. Akad. Wiss. Wien (Math.-Nat. Kl.) Abt. I. 133: 17-28. 22 fig. 1924.—The genera *Saurauia* and *Actinidia* have been variously referred to the Theaceae, Dilleniaceae, etc., or regarded as constituting a special family. The ovule and seed structure of *Saurauia napaulensis*, *Actinidia rufa*, and *A. chinensis*, is described. In both genera there is but 1 integument and the nucellus consists of a single cell layer. In *Saurauia*, investment of the embryo sac by the single integument is only partial. The endosperm is cellular. This "sympetalous" type of ovule is considered to have arisen independently and to show no relation to the Sympetalae. Such a reduced ovule is typical of *Bicornes*, near which these genera are believed to stand. Relationship with the Theaceae is shown also in choripetal, polystemony, structure of the stamen, and presence



of raphides. *Saurauia* is the older and connecting form, *Actinidia* represents a side branch, as do also the families Clethraceae and Ericaceae.—*F. Weiss.*

1822. SHULL, J. MARION. *Spathyema foetida*. Bot. Gaz. 79: 45-59. Pl. 1-4. 1925.—A biological and morphological study of the skunk cabbage. In the District of Columbia this plant flowers from November to April, "aided by its own internal warmth." Growth is monopodial until the first spathe appears; afterward it is sympodial. Leaf primordia for as many as 3 years are present at one time. The seed are without seed coats. The plants grow to indefinite age, the lower end of the trunk being worn away "by friction" as the contractile roots "drag it downward into the soil."—*A. J. Eames.*

1823. SIBILIA, C. Note di Teratologia vegetale. [Notes on plant teratology.] Bull. Soc. Bot. Italiana 1925<sup>1</sup>: 25. 1925.—The author describes cases of tetramery in *Crocus imperati* and *Romulea Bulbocodium*; union of 2 flowers in *Narcissus tazetta*, and fasciation of stem in *Osyris alba*. All the specimens were obtained from the province of Rome, Italy.—*Author (translated).*

1824. SPANGLER, R. C. Female gametophyte of *Trillium sessile*. Bot. Gaz. 79: 217-221. Pl. 16-17. 1925.—The archesporial cell had divided to form megasporocyte and primary wall cell by October. The 6 bivalent chromosomes as well as the heterotypic chromosomes are vacuolate. The two chalazal megaspores develop the female gametophyte, the micropylar 2 disintegrating. The male nucleus in the embryo sac is easily distinguished from the female gametophyte nuclei by its fine granular structure.—*B. W. Wells.*

1825. SPERLICH, ADOLF. Organen besonderer physiologischer Dignität. A. Die Absorptionorgane der parasitischen Samenpflanzen. [Organs of special physiological significance. A. Absorption organs of parasitic seed plants.] In: LINSBAUER, K. Handbuch der Pflanzenanatomie II Abt. 2. Teil. 52 p. 32 fig. Gebr. Bornträger: Berlin, 1925.—A description is given of the anatomy and development of haustoria in the higher parasitic plants. Page 1 gives a general description. Pages 2-23 discuss the absorption organs from the Rhinanthaceae to the Balanophoraceae; pages 24-43 consider the same organs of the Santalales to the Rafflesiaceae, and pages 43-48 are devoted to the haustorium of *Cuscuta*, mentioning briefly also those of *Cassytha*. A list of literature citations (90 titles) is appended. All that is known on the subject from previous publications, together with the views and experiences of the author, are concentrated in one publication and at many places suggestions are given for further investigations.—*J. C. Th. Uphof.*

1826. STIFFLER, ETHEL S. Development of embryo sac in *Gasteria*, *Cyrtanthus*, and *Veltheimia*. Bot. Gaz. 79: 207-216. Pl. 14-15, fig. 1-7. 1925.—In *Gasteria* the archesporial cell forms the primary parietal cell and megaspores, the 3 outer of which disintegrate, while the inner, by 3 successive nuclear divisions, develops into the 8-nucleate embryo sac. *Cyrtanthus* follows the *Lilium* type of embryo formation, the 8-nucleate sac developing directly by 3 nuclear divisions from the megaspore mother cell. The megaspore mother cell of *Veltheimia* forms a tetrad of which only the innermost megaspore develops. The embryo sac develops abnormally beyond the 4-nucleate stage.—*B. W. Wells.*

1827. TAKENOUCHI, YOSHIO. Morphological studies of sugar cane. Part II. Leaf-sheath. (Japanese.) Rept. Dept. Agric., Govt. Res. Inst. Formosa 5: (1-33). 8 pl. 1923.—Each leaf sheath grows out from the node and goes above into the leaf blade. Its lower part is so broad that not only does it surround the entire circumference of the stem, but also one margin overlaps the other; it is very remarkable that the 2 modes of overlapping (namely, left margin over right and vice versa) alternate in succeeding nodes of the stem. A ligule is always present, while auricles may or may not occur. The shape of each leaf sheath when expanded may be said to be trapezoid. Color varies; it is generally more or less green, rarely reddish purple. The duration is variable in different races, for example, averaging 71 days in a certain race. Growth takes place at the base. The epidermis consists of long cells and its anatomical structure differs on the lower and upper surfaces. Stomata are present on both surfaces. The cross section shows epidermis, fibrovascular bundles, bast fiber groups and parenchyma.—*Author (Courtesy Japanese Jour. Bot.).*

1828. TAKENOUCHI, YOSHIO. [Studies on the seed abscission in rice plants of Formosa.] (Japanese.) Rept. Dept. Agric. Govt. Res. Inst. Formosa 8: 1-17. 6 pl. 1923.—In various

rices of rice plants a certain number of grains separate out generally from their stalks before harvest, and in some this process takes place very easily, even from the slightest touch or by the wind. The proportion of grains thus falling is generally much greater in Formosan rice plants than in those cultivated in Japan proper, for example, 20%; this naturally means a heavy loss to the crop. For the abscission of rice grains a special tissue is formed in the boundary between the grain and its supporting stalk. It consists of 1-3 layers of lignified thin-walled cells; it begins to develop already in the very young panicle and soon attains its full development. When the grains begin to ripen, cells of this abscission tissue become dry and the natural consequence is their separation from their stalks. The intensity of the development of this tissue is various according to different races, hence the difference in the easiness with which the grains fall down. In a few races no abscission tissue comes to development at all, hence in such cases the grains separate out from the stalks with much difficulty.—*Author (Courtesy Japanese Jour. Bot.).*

1829. TAKENOUCHI, YOSHIO, AND KANGO HAYAKAWA. *Morphological studies of sugar-cane. Pt. III. Stem.* (Japanese.) Rept. Dept. Agric., Govt. Res. Inst. Formosa 6: (1-26). 11 pl. 1923.—Each stem of sugar-cane consists of a number of nodes and internodes. The node is divisible into 3 narrow circular zones, namely, growth zone, root zone, and waxy zone, the bases of leaf sheaths being placed on the boundary of the 2 latter zones. The internode is that long part contained between the waxy zone and the upper part of the growth zone belonging to the next lower internode. The growth zone may perhaps be considered as a part which is independent of the node and internode, and then the stem may be thought of as consisting of 3 parts, namely, internode, growth part, and node. The growth of the stem depends exclusively on the action of the growth part. The root zone is that from which the roots arise, and light colored, semitransparent spots seen in that zone may under proper conditions give rise to roots. The color of the stem varies (green, yellow, white, brown, red, purple, etc.) and is due to the pigment contained in the epidermal cells and the 2-3 layers of underlying cells, as well as to the cell-wall color of long cells. Increase in thickness of stem takes place exclusively in young portions near the apex. Buds are alternately placed in succeeding nodes, each of which always has one, rarely more than one.—The paper is divided into general and special parts. The first part contains general descriptions of the physical characters of stems, epidermis, fibrovascular bundles and parenchyma. The special part contains a comparative study of 5 races from the standpoints just discussed.—*Author (Courtesy Japanese Jour. Bot.).*

## MORPHOLOGY AND TAXONOMY OF ALGAE

WM. RANDOLPH TAYLOR, *Editor*

(See also in this issue Entries 1410, 1461, 1479, 1485, 1904, 1905, 2041, 2059, 2083)

1830. ANONYMOUS. *Scientific problems and progress.* Nature 116: 339-344. 1925.—This gives brief reports on the presidential addresses to the sections of the British Association meeting at Southampton. The address of J. LLOYD WILLIAMS was on "The Phaeophyceae and their problems."—*O. A. Stevens.*

1831. BØRGESSEN, F. *The marine algae of the Danish West Indies. Part 4. Rhodophyceae (4-6).* Dansk Bot. Ark. 3<sup>rd</sup>: 241-304. Fig. 231-307. 1918; 3<sup>rd</sup>: 305-368. Fig. 308-360. 1918; 3<sup>rd</sup>: 369-498 + 6. Fig. 361-435. 1920.—This is in continuation of a monograph the first part of which appeared in 1913-1914 and the 1st section of the Rhodophyceae in 1916. The following are described as new in the sections cited above: *Laurencia chondrioides* n. sp., *Polysiphonia sphaerocarpa* n. sp., *Cottoniella* n. gen., *C. arcuata* n. sp., *Gracilaria cylindrica* n. sp., *G. lacinulata* (Vahl.) n. comb., *Rhodymenia occidentalis* n. sp., *Coelothrix* n. gen., *C. irregularis* (Harv.) n. comb.—The last part concludes with a list of the Chlorophyceae, Phaeophyceae and Rhodophyceae found at the islands, together with addenda and corrections, and including the following, described as new: *Endoderma vagans* n. sp., *E. ventriculosum* n. sp. (Chlorophyceae); *Ascocyclus Hypneae* n. sp., *Myriotrichia occidentalis* n. sp. (Phaeophyceae); *Hypneocolax* n. gen., and *H. stellaris* n. sp. (Rhodophyceae).—In his concluding remarks



the author gives his definition of species and a general discussion of the algal vegetation of the islands and of the geographical position of the West Indian algal flora, which is summed up as follows: "The algal flora of the West Indian Islands in question shows a strikingly great resemblance to that of the Indo-Pacific Ocean. This applies especially to certain undoubtedly very old groups of Chlorophyceae. The Rhodophyceae . . . show less resemblance to those from the Indo-Pacific Ocean, being more closely related to the algal flora occurring in the Mediterranean-Atlantic territory.—The great similarity between those two algal floras: the West Indian and the Indo-Pacific, which in our days are so distinctly separated, has its natural explanation in a prehistoric old connection between the two oceans."—*Frederick V. Rand.*

1832. DENIS, M. *Revue des travaux parus sur les algues de 1910–1920. (Suite.)* [Review of the work concerning the algae appearing from 1910 to 1920. Continued.] *Rev. Gén. Bot.* 37: 279–288, 321–336, 369–384, 418–431, 462–480. 1925.

1833. LEBOUR, MARIE V. *The dinoflagellates of northern seas. viii + 250 p. 35 pl. 53 fig.* Marine Biol. Assoc. United Kingdom: Plymouth, 1925.—This is a Dinoflagellate (Peridinean) flora of the area covered by the International Investigations for the Exploration of the Sea, including also forms from the East Greenland Sea and Barents Sea, southward to northwest France and west to Iceland. An introductory chapter deals with the morphology of the organisms, the nomenclature of the thecal plates, the nutrition of the organisms, reproduction and general biology. The more primitive species are found in fresh or brackish water, both with respect to structure and nutrition. Large masses of a single species may occur in certain areas, such as estuaries; other species are adapted to live on sandy beaches partly uncovered by tides. Near the coast in the sea is a flora of neritic forms consisting of some of the simpler naked forms and many thecate ones, and although many are holophytic the majority are probably saprophytic. The oceanic species include most of the naked species, especially those with bright colors, most of the genus *Ceratium*, many *Peridinium*s and many of the *Dinophysidae* with conspicuous wings or spines which aid in keeping them afloat. The oceanic species of *Peridinium* are probably saprophytic, those of *Ceratium* are holophytic and the naked genera are holozooic. Dinoflagellates are most naturally organisms of warm waters, being largely absent from the area under consideration during the winter. The maximum of the dinoflagellates follows that of the diatoms toward the latter part of the spring. They are of great importance as a source of food for the larger animals. Some species are parasitized by protozoa, as by *Amoebophyra*. Changes in nomenclature involve the following: *Pronoctilucidae* [Family] n. nom., for *Protodiniferidae* Kofoid and Swezy, *Amphidinium latum* n. sp., *A. scissoides* n. sp., *A. phaeocysticola* n. sp., *A. pelagicum* n. sp., *Gymnodinium pygmaeum* n. sp., *G. rubrocinctum* n. sp., *G. splendens* n. sp., *G. minutum* n. nom. for *Amphidinium rotundatum* Lohmann, *G. hyalinum* n. sp., *Gyrodinium lingulifera* n. sp., *G. calyptroglyphe* n. sp., *G. cochlea* n. sp., *Cochlodinium helicoides* n. nom. for *C. helix* Schütt, p.p., *C. pupa* n. sp., *C. achromaticum* n. sp., *Protopsis simplex* n. sp., *Phalacroma irregulare* n. sp., *Glenodiniidae* n. fam., *Goniaulax unicornis* n. sp., *G. Tamarensis* n. sp., *G. longispina* n. sp., *Minuscula* n. gen., *M. bipes* (Paulsen) Lebour n. comb. In an appendix the methods of collecting and preserving material are outlined, with the methods for preparing the cells for the study of the thecal plates.—*Wm. Randolph Taylor.*

1834. OKAMURA, KINTARO. *Icones of Japanese algae* 5. No. 2. P. 21–42. 5 pl. 1924.—This number contains *Cystophyllum sisymbrioides* J. Ag., *Sargassum serratifolium* Ag., *S. tortile* Ag., *S. enerve* Ag., and *S. Ringoldianum* Harv.—*Author (Courtesy Japanese Jour. Bot.).*

1835. PASCHER, A. *Die Süßwasserflora Deutschlands, Österreichs und der Schweiz. Heft 11. Heterokontae, Phaeophyta, Rhodophyta, Charophyta.* By A. PASCHER, J. SCHILLER, AND W. MIGULA. iv + 250 p. 96 + 7 + 94 + 14 fig. Gustav Fischer: Jena, 1925.—In addition to the systematic section this manual includes general discussions of the morphology of the cell, including especially the chromatophores and the wall, of each group treated, and also discussions of the life cycle, evolution, interrelationships and methods of culture and study, with extensive bibliographies. The forms treated are not only those already known from central Europe, but also those which in the opinion of the authors are likely to be found in that territory or are of special systematic or evolutionary significance. There are listed

the following new organisms and new combinations: *Botrydiopsis turfosa* Pascher, n. sp. *Tribonema aequale* Pascher n. sp., *T. viride* Pascher n. sp., *T. Gayanum* Pascher n. sp., of the Heterokontae; *Lemanea ciliata* (Siridot) Pascher & Schiller n. comb. and *L. rigida* (Siridot) Pascher & Schiller n. comb., of the Rhodophyceae. A special reorganization of the genus *Tribonema* causes the discarding of the names *T. tenerrimum*, *T. Raciborski* and *T. cylindricum*, and the partitioning of *T. bombycinum* between *T. Gayanum*, *T. viride* and perhaps other species.—Wm. Randolph Taylor.

1836. PASCHER, A. Die Süßwasserflora Deutschlands, Österreichs und der Schweiz. Heft 12. Cyanophyceae, Cyanochloridinae, Chlorobacteriaceae. By GEITLER, L., AND A. PASCHER. iv + 481 p. 560 + 11 fig. Gustav Fischer: Jena, 1925.—For the Cyanophyceae (Myxophyceae) this volume approximates a complete survey of the freshwater members of the group irrespective of where they have been found. In addition to the systematics there are discussed the cytology, morphology of vegetative cells and reproductive organs, development, phylogeny and fundamental systematics, biology and methods of study. In view of the wide field covered in the systematic portion of the text, the keys are of special importance. The following probably represent new changes in nomenclature, although not specifically so designated: *Chroococcus Mipitanensis* (Wolos.) Geitler, *Coelosphaerium halophilum* (Lemm.) Geitler, *Cyanodictyon reticulatum* (Lemm.) Geitler, *Merismopedia glauca* f. *insignis* (Schkorb.) Geitler, *Merismopedia maior* (G. M. Smith) Geitler, *Rhabdoderma irregulare* (Naum.) Geitler, *Chlorogloea microcystoides* Geitler, *Chroococcopsis gigantea* Geitler, *Pleurocapsa minor* emend. Geitler, *Oncobyrsa rivularis* Kütz. emend. Geitler, *Xenococcus rivularis* (Hansg.) Geitler, *X. fluviatilis* (Lagerh.) Geitler, *Dermocarpa versicolor* (Borzi) Geitler, *D. parva* (Conrad) Geitler, *D. aquae-dulcis* (Reinsch.) Geitler, *D. sphagnicola* (Maillefer) Geitler, *Chamaesiphon* A. Br. & Gr. emend. Geitler, *Chamaesiphon aggregatus* (Jancz.) Geitler, *Siphononema polonicum* (Racib.) Geitler, *Mastigocolepsis obtusa* (N. Carter) Geitler, *Stigonema ocellatum* (Dillw.) Thuret to include *S. panniforme* (Ktz.) Hieron., *S. tomentosum* (Ktz.) Hieron. and *S. anomalum* Blanchard, *Leptochaete gracilis* (Hansg.) Geitler, *Calothrix floccosa* (Woron.) Geitler, *Tolypothrix Reehingeri* (Wille) Geitler, *Leptobasis crassa* (G. S. West) Geitler, *Anabaena constricta* (Szafer) Geitler, *Spirulina spirulinoides* (Ghose) Geitler, *S. curta* (Lemm.) Geitler, *S. Gomontiana* (Setchell) Geitler, *S. Jenneri* (Stitz.) Geitler, *S. platensis* (Nordst.) Geitler, *S. Massartii* (Kuff.) Geitler, *Oscillatoria lacustris* (Kleb.) Geitler, *Schizothrix Naegelii* (Ktz.) Geitler, *S. nullipora* (Grun.) Geitler, *Lyngbya pseudospirulina* Pascher n. nom., *Schizothrix porphyromellana* (Brühl & Biswas) Geitler.—Important features of classification include the following: Three series are recognized, Chroococceae, Chamaesiphonaceae and Hormogoneae. Two orders appear in the first, Chroococcales and Entophysidales, the former with the Chroococceae only, the latter with the Entophysalidaceae and the Chlorogloeaceae. The Chamaesiphonaceae include 3 orders: Pleurocapsales with Pleurocapsaceae, Dermocarpales with Dermocarpaceae and Chamaesiphonaceae, and Siphononematales with Siphononemataceae. The 3rd series is divided into 2 orders, Stigonematales and Nostocales. The Stigonematales include Lorelliaceae, Pulvinulariaceae, Capsosiraceae, Loeffgreniaceae, Nostochopsaceae and Stigonemataceae. The Nostocales include Mastigocladaceae, Rivulariaceae, Scytonemaceae, Microchaetaceae, Nostocaceae and Oscillatoriaceae. Several of the changes in arrangement involved, as well as many of the species listed, appear for the first time in any comprehensive work.—In the 2nd section of the book it is indicated that the term Chlorobacteriaceae must give way to that of Cyanochloridinae, but it is considered that the assemblage of forms is a provisional one. The morphology and literature are given. *Pelodictyon clathratiforme* (Szafer) Geitler, and *P. Lauterbornii* Geitler probably involve changes in nomenclature.—Wm. Randolph Taylor.

1837. TONI, G. B. DE, AND A. FORTI. Alghe di Australia, Tasmania, e Nuova Zelanda raccolte dal re. dott. Guiseppe Capra nel 1908–1909. [Algae of Australia, Tasmania and New Zealand collected by Guiseppe Capra, 1908–1909.] Mem. Reale Inst. Veneto Sci., Lett. Art. 29<sup>a</sup>. (1–183). 10 pl. 1923.



## MORPHOLOGY AND TAXONOMY OF BRYOPHYTES

ALEXANDER W. EVANS, *Editor*

(See also in this issue Entries 1474, 1492, 1696)

1838. ANONYMOUS. **Hepatics.** British Bryological Soc. Rept. 1: 168-176. 1925.—The hepatics distributed include 119 European and 11 non-European species, the latter being listed separately. A few critical notes by D. A. J[ONES] and H. H. K[NIGHT] are included.—*A. W. Evans.*

1839. ANONYMOUS. **Sphagna.** British Bryological Soc. Rept. 1: 120-130. 1925.—The *Sphagna* distributed are referred to 50 species, most of which are represented by 2 or more varieties or forms. Although the majority of the specimens were collected in the British Isles a considerable number came from Belgium and other parts of Europe. Critical notes by D. G. C[ATCHESIDE], W. R. S[HERRIN], and J. A. W[HELDON] are interpolated.—*A. W. Evans.*

1840. ANONYMOUS. **True mosses.** British Bryological Soc. Rept. 1: 131-167. 1925.—The mosses distributed include 478 species from various parts of Europe and 31 from other parts of the world. The extra-European species are listed separately. Numerous critical notes by H. N. D[IXON], D. A. J[ONES], W. E. N[ICHOLSON], P. G. M. R[HODES], E. A. R[ICHARDS], and G. B. S[AVERY] are scattered through the list.—*A. W. Evans.*

1841. ANONYMOUS. **Two new European varieties of *Cratoneuron*.** British Bryological Soc. Rept. 1: 177. 1925.—The following varieties are proposed as new: *Cratoneuron glaucum* var. *scolopendrioides* Rhodes and *C. falcatum* var. *subjulaceum* Wheldon & Rhodes. The 1st was based on specimens collected by V. Mazzuchelli near Pordonone, Italy, and the 2nd on specimens collected by P. G. M. Rhodes at St. Luc, Switzerland. The 2nd variety has been found also near Modena, Italy, by A. Lunardi.—*A. W. Evans.*

1842. ANONYMOUS. [Rev. of: DIXON, H. N. **The students handbook of British mosses.** 3d ed. xlviii + 552 p. 63 pl. V. V. Sumfield: Eastbourne; Wheldon & Wesley: London, 1924 (see Bot. Absts. 14, Entry 2763).] *Nature* 116: 239-240. 1925.—The reviewer commends the work but notes a few errors.—*O. A. Stevens.*

1843. ARMITAGE, ELEONORA. **Report of the Annual Meeting 1924.** British Bryological Soc. Rept. 1: 118-119. 1925.—The meeting was held at Llanberis, Carnaroonshire, Wales, under the presidency of H. N. Dixon, from August 29th to September 5th. The excursions made by the members present are described and the more interesting of the bryophytes found are mentioned. The species listed include 14 mosses and 7 hepatics. One of the mosses, *Grimmia andreaeoides* Limpr. was new to the British Isles and 2 other mosses were new to Wales.—*A. W. Evans.*

1844. BINSTED, C. H. **An autumn at the English Lakes.** British Bryological Soc. Rept. 1: 114-117. 1925.—During the autumn of 1924 the author explored various localities in the Lake District for mosses, making his headquarters at Portinscale, near Keswick. Among the species collected he mentions about 50 of the more interesting, 3 being new to Vice County 70 and 2 to Vice County 69.—*A. W. Evans.*

1845. DOUIN, R. **Les Muscinées de la région du Lantaret.** [The mosses of the region of Lantaret.] *Rev. Gén. Bot.* 37: 241-260. 1925.—The region of Lantaret, France, is relatively rich in mosses, and in the study of the distribution of the species it is at times rather difficult to indicate any very sharp limits between different groups. An account of the entire moss vegetation of the region is given, with a description of the physiognomy of this type of vegetation in the different localities.—*J. C. Gilman.*

1846. DOUIN, CH. **Recherches sur la gamétophyte des Marchantiées.** [Investigations concerning the gametophyte of the Marchantiaceae.] *Rev. Gén. Bot.* 37: 63-85, 113-130. *Fig. 141-158.* 1925.—The preceding parts of this series have been abstracted (see Bot. Absts. 13, Entry 1812; 14, Entry 497; and 15, Entry 778). In this, the 5th part, the author discusses the differentiated thalli of the Marchantia and their various organs, reaching the following conclusions for the entire group: the antheridia are always lateral and arise from secondary initial cells; the archegonia, on the other hand, are always terminal and arise from female differentiated terminal initials, the function of which is thus stopped. Since these features

are characteristic of the true acrogynous liverworts, the Marchantiae are therefore acrogynous and not anacrogynous as maintained by Stephani in his *Species Hepaticarum*.—In the differentiated thalli nature shows the extent of its resources with a very simple mechanism. The 2 most curious examples are indisputably the involucre of *Fegatella*, both male and female, and the female receptacle of *Marchantia*. The involucre are characterized by the remarkable way in which the 2 thalli are united; the female receptacle, by the disposition and curious grouping of the numerous thalli composing it.—*J. C. Gilman*.

1847. DOULIN, R., AND A. DAVY DE VIRVILLE. *Action du milieu sur le Fegatella conica Corda*. [Influence of the environment on *Fegatella conica* Corda.] *Rev. Gén. Bot.* 36: 513-529. 1924.—The action of 2 factors, light and water, produce very important modifications in the form and structure of *Fegatella conica*. Suppression of light causes a considerable retardation and reduction of all the organs. In the dark, the branches of the thallus do not develop, and the air chambers are extremely reduced, so that the characteristic appearance of the upper surface of the normal thallus entirely disappears. The chlorophyll grains diminish in size and number but the chlorophyll is never entirely lacking. Finally, the rhizoids are always reduced in size and number. The scales become very small but keep their characteristic form. Saturation of the atmosphere and aquatic environment likewise lead to reduction in the size of the thallus and of the cells which constitute it. They bring about an increase in growth, as shown by the length of the shoots in different cultures. The greater development of the air chambers should also be noted. There is a greater projection of the stomata and an increase in the size of the ostioles. All these characters become modified in relation to the liquid and gaseous exchange between the plant and its environment. The chlorophyll is less abundant. The rhizoids are very well developed, probably due to the decreased intensity of the light. The scales are markedly reduced but less so than in darkness. The results show that organs as important as the air-chambers and the stomata may be completely modified and even lost as a result of external conditions. This adaptation of *Fegatella conica* to its environment shows the great plasticity of the hepatics.—*J. C. Gilman*.

1848. HENNEN, J. *Harpidium* var. nov. *British Bryological Soc. Rept.* 1: 117. 1925.—A description of *Hypnum fluitans* var. *pseudogracile* Van den Broeck is here communicated. It was based on material collected at St. Job-in-'t-Goor, near Antwerp, Belgium.—*A. W. Evans*.

1849. MÖLLER, HJALMAR. *Lövmossornas utbredning i Sverige. IX. Bartramiaceae*. [The distribution of mosses in Sweden.] *Arkiv Bot.* 19<sup>11</sup>: 1-147. 14 fig. 1925.—The preceding parts of this series have been abstracted (see Bot. Absts. 13, Entries 279-282).<sup>6</sup> In the present part descriptions are given of the following species: *Bartramia ithyphylla* Brid., with the vars. *breviseta* (Lindb.) Kindb. and *strigosa* (Wahlenb.) C. Hartm.; *B. norvegica* (Gunn.) Lindb.; *B. pomiformis* (L.) Hedw., with the vars. *crispa* (Sw.) Br. Eur. and *heteromalla* (Brid.) C. Müll.; *B. subulata* B. & S.; *Conostomum tetragonum* (Dicks.) Lindb.; *Philonotis Arnellii* Husnot; *P. caespitosa* Wils., with the var. *laxa* (Warnst.) Loeske & Warnst.; *P. calcarea* (B. & S.) Schimp., with the var. *fluitans* Matousch.; *P. fontana* (L.) Brid., with the vars. *adpressa* (Ferg. in part) Loeske & Möller, *parvula* Lindb., and *tenera* Bauer; *P. marchica* (Willd.) Brid.; *P. Osterwaldii* Warnst.; *P. seriata* Mitt., with the vars. *adpressa* (Ferg. in part) Loeske & Möller and *mollis* (Schimp.) Loeske; *P. tomentella* Mol., with the vars. *borealis* (Hag.) Loeske, *fontanoides* Loeske & Möller, *gracilis* Loeske, and *subcapillaris* (Kindb.) Loeske; and *Plagiopus Oederi* (Gunn.) Limpr., with the var. *alpina* (Schwaegr.) Möller. The distribution of each species and variety is represented diagrammatically.—*O. Heilborn*.



## MORPHOLOGY AND TAXONOMY OF FUNGI, LICHENS, BACTERIA, AND MYXOMYCETES

H. M. FITZPATRICK, *Editor*

J. E. FLYNN, *Assistant Editor*

(See also in this issue Entries 1439, 1781, 1936, 2062, 2065, 2071, 2077, 2079, 2097, 2099, 2101, 2104, 2105, 2126)

### FUNGI

1850. ANONYMOUS. [Rev. of: BULLER, A. H. REGINALD. *Researches on fungi* 3. The production and liberation of spores in Hymenomycetes and Uredineae. xii + 611 p. Longmans, Green & Co.: London, 1924 (see Bot. Absts. 14, Entry 3624).] *Nature* 116: 10. 1925.

1851. DICKSON, B. T. *Colletotrichum* v. *Vermicularia*. *Mycologia* 17: 213-217. *Pl.* 21. 1925.—*Vermicularia maculans* (Link) Desm., *V. minuta* (Link) Libert, and *V. orthospora* Sacc. & Roum. were all found to belong to the genus *Colletotrichum*, and the consequent new combinations are made. *V. varians* Ducomet is considered identical with *C. atramentarium* (B. & Br.) Taub.—G. R. Bisby.

1852. DIEHL, WILLIAM W. The genus *Astrocystis*. *Mycologia* 17: 185-190. *Pl.* 19. 1925.—Notes are given on the structure of the perithecium of the monotypic genus *Astrocystis*, and the genus and species *A. mirabilis* B. and Br. are redescribed.—G. R. Bisby.

1853. FUCHS, J. Über die Beziehungen von *Fusarium* zu anderen Fruchtformen. [The relation of *Fusarium* to other fruiting forms.] *Zeitschr. Pflanzenkrankh.* 34: 193-220. 7 fig. 1924.—A theoretical discussion emphasizing the fact that *Fusarium* is not a natural genus.—H. M. Fitzpatrick.

1854. GARRETT, A. O. Smuts and rusts of Utah. V. *Mycologia* 17: 202-209. 1925.—The host range of a number of the rusts of Utah is extended, and the total number of rusts known in the state is brought up to 223. *Tilletia foetens* is recorded.—G. R. Bisby.

1855. GUYOT, L. De l'existence de formes pycnidiennes chez *Ophiobolus graminis* Sacc. et *O. herpotrichus* (Fr.) Sacc. [Pycnidia of *Ophiobolus graminis* Sacc. and *O. herpotrichus*.] *Rev. Path. Vég. et Entomol. Agric.* 12: 74. Fig. 1-6. 1925.—Pycnidia of *Wojnowicia graminis* (McAlp.) Sacc. are often observed at the base of wheat and grass stalks whether these be infested or not with *Leptosphaeria herpotrichoides*. The *Wojnowicia* was readily cultured from the affected stalks and yielded pycnidia on various culture media. In no case were cultures obtained similar to cultures of either *Ophiobolus* or *Leptosphaeria*. Wheat seedlings were successfully infected by *Wojnowicia*, which fungus is considered a parasite of wheat, distinct from *Ophiobolus* or *Leptosphaeria* and without any economic importance.—J. Dufrenoy.

1856. HOLWAY, E. W. D. *North American Uredineae*. 1<sup>st</sup>: 97-131. *Pl.* 45-54. Minneapolis, Minnesota, 1924.—The 5th and final part of this well known work, the first part of which appeared in 1905, is similar in appearance and method of treatment to the 4 preceding parts. It has been published posthumously through the efforts of Mrs. Holway, members of the staff of the University of Minnesota, and J. C. Arthur. A short preface by Arthur, a title page, and indices are provided. Thirty-seven species are described and figured.—H. M. Fitzpatrick.

1857. HOTSON, JOHN WILLIAM. Preliminary list of the Uredinales of Washington. *Publ. Puget Sound Biol. Sta.* 4: 273-391. Univ. of Washington: Seattle, Washington, 1925.—The author lists 224 species of Uredinales that occur in the state of Washington. A detailed list of localities in which the various species are found is given for each species of rust. There is an original key to genera and species. *Chrysomyxa piperiana* (Arth.) Hotson on *Rhododendron Californicum* Hook. is given as a new combination.—George L. Zundel.

1858. MARTIN, G. W. Paradichlorobenzene in the herbarium. *Bot. Gaz.* 79: 450. 1925.—This insecticide is recommended for use in herbaria, especially mycological herbaria. A packet of crystals is placed in the top of the container and the emanating gas, which is heavier than air, moves downward, killing any insects present. It has not been found objectionable to the herbarium worker.—B. W. Wells.

1859. MURRILL, W. A. **Fungi at Lynchburg, Virginia.** *Mycologia* 17: 183-184. 1925.
1860. ORTON, C. R., AND FREEMAN WEISS. The life cycle of the rust on fly poison, *Chrosperma muscaetoxicum*. *Mycologia* 17: 148-153. Pl. 17. 1925.—*Puccinia atropuncta* with II and III on *Chrosperma* was found to be not autoecious as heretofore considered, cultures proving that O and I occur on *Nabalis trifoliatus*, *N. serpentarius*, *N. integrifolius*, and *N. albus*. Infections failed on 3 species of *Lactuca*, Aeciospores from *Nabalis* infected *Chrosperma*, but neither *Veratrum viride* nor *Stenanthium gramineum*. *Puccinia hieraciata* probably has similar aecia on *Nabalis*, and the 2 rusts show a further correlation in the similarities of their II and III stages.—G. R. Bisby.
1861. PASINETTI, L. **La fermentazione alcoolica dei datteri.** [The alcoholic fermentation of the date.] *Boll. Ist. Sieroterapico Milanese*. 3: 1-15. 1924.—The microflora of the date, obtained by sowing fragments scraped from the fruit on various substrata, reveals the presence of various Schizomycetes, a Rhizopus and *Torula* (*Torulopsis*) *dactyli*, regarded as probably a new species. The author completes his work with fermentation tests with various species of Saccaromycetes, studying the behavior of the date as primary material in alcoholic fermentation.—R. Ciferri (translated).
1862. SEAVER, FRED. J. **Discomycetes of Australia.** *Mycologia* 17: 222-224. 1925.—The author reviews a paper by McLennan and Cookson on "Additions to the Australian Ascomycetes, No. 1," and says that there is a striking similarity between various Discomycetes found in Australia and in North America.—G. R. Bisby.
1863. SPEGAZZINI, C. **Un nuevo genero de las Helvellaceae.** [A new genus of the Helvellaceae.] *Mycologia* 17: 210-212. Fig. 1. 1925.—*Cudoniopsis* n. gen. and the species *C. pusilla*, are described. The fungus produces a superficial sclerotium on living branches of *Eugenia proba* from which ascomata having a sterile stipitate and an ascigerous pileate portion, arise.—G. R. Bisby.
1864. STEVENS, F. L., AND H. W. MANTER. **The Hemisphaeriaceae of British Guiana and Trinidad.** *Bot. Gaz.* 79: 265-296. Pl. 18-21. 1925.—Following an account of the family and its subdivisions, keys to the genera and species of the sub-families are given, accompanied by notes on previously described species and descriptions of many new species. The names of the new species follow: *Dictyothyrium disporum*, *D. guianensis*, *D. philodendri*, *D. vismiae*, *Micropeltis tetraspora*, *M. dispora*, *M. dissociabilis*, *M. aroidicola*, *M. guianensis*, *Micropeltella constricta*, *M. sparsa*, *Scolecopeltidium mirabile*, *S. multiseptatum*, *S. hormosporum*, *S. Liciniae*, *S. costi*, *Theciopeltis guianensis*, *Microthyriella guianensis*, *M. distincta*, *Plochmopeltidella* n. gen. Mendoza, *P. smilacina*, *Stomiopeltis cassiae*, *Stomiopeltella suttoniae*, *Scolecopeltidella palmorum*.—B. W. Wells.
1865. STEVENS, NEIL E. **The life history and relationships of Diplodia gossypina.** *Mycologia* 17: 191-201. Pl. 20. 1925.—The perfect stage of *Diplodia gossypina* was found to be a *Physalospora* and is provisionally called *P. gossypina*. It differs from *P. malorum* in possessing slightly larger perithecia and ascospores. The pycnidial stages of the 2 fungi are easily distinguishable. *D. gossypina* is morphologically like *D. natalensis*, but its temperature relations are different. *Botryosphaeria fuliginosa* as used by Ellis and Everhart includes species belonging to both *Botryosphaeria* and *Physalospora*. *B. Ribis* is the name now applied to the *Botryosphaeria* on cotton.—G. R. Bisby.
1866. STRASSER, P. **Achter Nachtrag zur Pilzflora des Sonntagberges (N. Oe.) 1923.** [Eight supplements to the fungus flora of Sonntagberges, Northern Austria 1923.] *Verhandl. Zool.-Bot. Ges. Wien* 73: 223-247. 1923.—The following new species are given: *Sclerophomella anonyma* v. H., *Colophoma rosacearum* v. H., *Centhospora Corni* v. H., *C. pirina* Strass., *Ascochyta Daphnes* v. H., *Rhabdospora maior* Strass., *Phlytaena Ranunculacearum* v. H., *P. Lapparum* v. H., *P. pomi* v. H., *Hendersonia Helianthi* Strass., *Graphium altissimum* Strass., *Chaetobasiella vermicularioides* v. H., *Chaetosphaeria caespitulosa* v. H., *Gnomoniella prunicola* v. H., *Pseudohelotium* (*Pezizella*) *Strasserii* Keissler, *Dasyscypha Corni-maris* v. H., *Leptothyria exigua* v. H.—H. Cammerloher (translated).
1867. SUNDARARAMAN, S., AND K. M. THOMAS. **Some of the Diplodias found in Southern India.** *Year Book Madras Agric. Dept.* 1923: 32-38. 1924.—Without giving specific names to the fungi, diagnoses are given (including descriptions of pycnidia, spores, paraphyses, etc.)



for species of *Diplodia* on *Bursera*, *Theobroma*, *Hevea*, *Areca*, *Ficus*, *Camellia*, *Moringa*, *Citrus*, *Erythrina*, *Saccharum*, *Opuntia*, *Anona*, and *Cocos*.—P. S. Jivanna Rao.

1868. TORO, RAFAEL A. New or noteworthy Porto Rican Pyrenomycetes. *Mycologia* 17: 131-147. Pl. 16-17. 1925.—*Asterina Kernii*, *Morenoella Whetzellii*, *Scolecopeltis micropeltiformis*, *S. Cestri*, *S. Ionopsidis*, *S. Ingae*, *S. Chardonii*, *Irene portoricensis*, and *Phaeosacardinula Seaveriana* are described as new. Several new combinations are made.—G. R. Bisby.

1869. VANDENDRIES, RENÉ. Contribution nouvelle à l'étude de la sexualité des Basidiomycètes. [A recent contribution to the study of sexuality in the Basidiomycetes.] *La Cellule* 35: 129-155. Pl. 1-2. 1925.—The writer concludes that *Coprinus radians* is a heterohomothallic species. The spores of a given fruit-body are in part of one sex and in part of another, but the sexes do not appear to be identical with those on other fruit-bodies. Mycelia arising from spores of one fruit-body may be thus unable to conjugate with "foreign" mycelia. Apogamous fruit-bodies are not developed, and there is no indication in the conjugations of "pluri-polar" sexuality.—J. Beauverie (translated).

### LICHENS

1870. MAGNUSSON, A. H. Några märkligare lavfynd. [Some noteworthy lichens.] *Svensk. Bot. Tidskr.* 19: 111-114. 1925.—Some new localities of lichens in Sweden are reported: *Cetraria normoerica* (Gunn.) Lynge in province Västergötland; *Cladonia caespiticia* (Pers.) Flk. from 3 places in the provinces Västergötland and Holland (only 1 Swedish locality previously known); *Cladonia incrassata* Flk. from 3 places in Västergötland and Holland (only 1 Swedish locality previously known); *Stictia limbata* (Sm.) Nyl. from province Bohuslän (1st Swedish locality); *Lecanora (Placodium) demissa* (Flot.) Zahlbr. from Västergötland (1st Swedish locality); *Lecidea assimilis* Hampe from several places in Bohuslän and Västergötland (only 1 Swedish locality previously known); *Leptogium palmatum* (Huds.) Mont. from 2 places in Bohuslän (only 2 Swedish localities previously known); and *Peltigera lepidophora* (Nyl.) Bitter from several places in provinces Lapland and Upland as well as from Gudbrandsdalen in Norway.—O. Heilborn.

1871. MOREAU, FERNAND, ET MME. FERNAND MOREAU. Recherches sur quelques lichens des genres *Parmelia*, *Physcia* et *Anaptychia*. *Rev. Gén. Bot.* 37: 385-417. 1925.—Several lichens, particularly *Parmelia acetabulum*, *Physcia parietina* and *Anaptychia ciliaris* were investigated. In all the forms studied, gonidia of the type reported by the authors in the genus *Trebouxia* were found. The structure of the pyrenoid is reticulate, at least after fixation. The division of the pyrenoid precedes that of the gonidium. The phenomenon of haptotactism by which the gonidia stimulate in those hyphae which they touch the production of short branches ("external suckers") was observed. The structure differs in detail in different species but conforms in general to the same type of organization. The medullae possess plasmodesmal margins. The trichogyne and spermatia do not enter into the development of the apothecium. The origin of the diverse tissues of the apothecium, particularly the excipulum of *Parmelia acetabulum* depends on a plectenchymatic shell which surrounds the young ascogonial formation. The young ascogone is uninucleate but becomes plurinucleate as it grows older, at least in the case of *Physcia parietina*. The cells of the ascogonous hyphae are at first uninucleate, then plurinucleate. Clamp-connections occur on the hyphae with binucleate cells, and their formation occurs previous to the production of the ascus. In *Anaptychia ciliaris* the asci are branched. The spores are simple in *Parmelia acetabulum*, multinucleate in *Physcia parietina*, and 2-celled in *Anaptychia ciliaris*. The possible dimorphism of the latter 2 is mentioned, and the precocious germination within the ascus of *Parmelia acetabulum* was observed. It is the custom to distinguish 2 main types of Ascomycetes. One like *Pyronema* has a coenocytic ascogone which copulates with a plurinucleate antheridium. *Peltigera*, *Peltidea* and *Solorina* possess ascogones of this type. Other Ascomycetes possess an ascogone in the form of a winding thread with uninucleate cells. In such forms fecundation is attributed to spermatia by the intermediation of a trichogyne, the extremity of which is extruded above the surface of the thallus. First discovered among the lichens in *Collema*, this type of ascogone has been found in a large number of other genera. Reasoning from these facts and ignorant of the relation of the one type of fertilization to the other, a double origin for the

Ascomycetes would seem probable, one, with the affinities among the siphomycetous fungi, with coenocytic sex organs, the other nearer the Florideae which have spermatia and trichogynes. Such a separation of the Ascomycetes into 2 series is no longer possible, however, without a consideration of the arguments developed by Dangeard in favor of monophylysm of the Ascomycetes, and in the study of the development of *Physcia parietina*, the connecting form between the 2 preceding series, an ascogone with cells at first uninucleate but becoming later plurinucleate is furnished. It is not merely because of the existence of a multinucleate phase in the development of the ascogone that the history of the Ascomycetes of the 2 types may be linked. In the Peltigeraceae the authors have described previously, at the base of the ascus in an old apothecium, ascogenous hyphae with binucleate cells. This same phase has now been found among the forms studied here. Furnished with a persisting dikaryophase, these Ascomycetes can be linked to the Basidiomycetes, especially since on the mycelium of their binucleated cells clamp-connections identical to those of the Basidiomycetes are produced. Further, just as at the base of the basidium on the ultimate cells of the mycelium with clamp connections, one is able to see vestiges of the projection which governed their formation; so at the base of the ascus, in the lichens studied, the ultimate cells of the chains of dikaryocytes show projections which have anticipated their separation. The observation of such connections at the base of the asci assures their common origin with the basidia. Sometimes the end of the projection does not fuse with the subjacent cell of the ascus. Then certain conditions are realized which are described by many authors as ascogenous hooks. Two points should still have the attention of workers on the study of the development of the Ascomycetes. (1) The trichogyne which does not intervene as an organ of copulation in the phenomena which have just been described, is still of uncertain nature and a study of comparative morphology would show perhaps that it is the homologue of the continuous trichogyne, present in *Pyronema*, and the vestige of the organ which formerly assured effective copulation between the ascogone and a lost antheridium. (2) The exact superposition of the cycle of development of Ascomycetes and Basidiomycetes invites search at the origin of the dikaryophase of the 1st for the phenomena of cytogamy which inaugurate the dikaryophase of the 2nd. Ignorance of the origin of the binucleate condition in the Ascomycetes alone obscures their proper placing.—J. C. Gilman.

1872. TOBLER, FRIEDRICH. *Biologie der Flechten*. [Biology of the Lichens.] vii+266 p. 1 col. pl., 67 fig. Gebrüder Borntraeger: Berlin, 1925.—The author states that a part of the material published for the first time in this monograph dates from 1910. In 1914 the general plan for a work setting forth the structure and life of the lichens was completed but publication was postponed due to the war. In the meantime in 1921 there appeared the comprehensive work by ANNIE L. SMITH (see Bot. Absts. 11, Entries 2749, 3459; 12, Entry 2002), with a summary of the literature of lichenology, including most of that published during the war. In view of the appearance of this work the author believes it now unnecessary for him to detail the structure of lichens and hence confines himself largely to their biology, which is discussed under the following headings: (1) Development and growth (reproduction of algae and of fungi, culture and germination of lichenous fungi, "Wanderflechte," isidia, soredia, cephalodia, growth of the thallus, gall formation); (2) physiology (ash constituents, calcium oxalate, intake of inorganic materials, water intake and conduction, gaseous exchange, carbon assimilation, lichenous pigments, acids and other organic constituents, wall materials, "Gallertbildung," light direction and growth); (3) ecology (relations to substrata, substrata, lichen stations); and (4) symbiosis (the phenomenon of symbiosis, living together without symbiosis?, Elfving's view, from symbiosis to parasitism, location of lichens in the taxonomic system, evolution of lichens).—Preceding the indexes to plant names and subjects, the work ends with a 37-page catalogue of the literature of lichenology, including brief comments on each entry.—Frederick V. Rand.

#### BACTERIA

1873. BRYANT, CARRIE KIRK. A new or delta type streptococcus. Jour. Bact. 10: 53-58. 2 fig. 1925.

1874. DAMON, S. R., AND W. A. FIERER. Anaerobic sporulating thermophiles. Some observations on a new group of bacteria. Jour. Bact. 10: 37-46. 1925.—Four new species of



anaerobes are described: *Clostridium thermoputrificum*, *C. thermoacrogenes*, *C. thermoacidophilus*, and *C. thermochainus*. The optimum temperatures for these bacteria are between 37° and 55°; the maximum for growth, 60°–65°; and the thermal death point, 110°–120°.—*C. E. Skinner*.

1875. McCULLOCH, LUCIA. *Aplanobacter insidiosus* n. sp., the cause of an alfalfa disease. *Phytopathology* 15: 496–497. 1925.—A technical description of the organism is given.—*B. B. Higgins*.

1876. MURRAY, T. J. A rapid method for the filtration of culture media. *Amer. Jour. Public Health* 15: 823. 1 fig. 1925.—A hemispherical wire strainer is placed in a funnel and lined with a half inch layer of absorbent cotton. Directions are given for the filtering. It is claimed that the method is very rapid and that media filtered in this way are extremely clear.—*C. A. Ludwig*.

1877. ROGERS, L. A. The American type-culture collection. *Science* 62: 267. 1925.—Requests for a free copy of the tentative catalogue of this collection should be addressed to Dr. George H. Weaver, Curator, John McCormick Inst. for Infectious Diseases, 637 South Wood St., Chicago.—*C. J. Lyon*.

1878. STEARN, ESTHER WAGNER, AND ALLEN E. STEARN. A study of chemical differentiation of bacteria. *Jour. Bact.* 10: 13–23. 5 fig. 1925.—Further evidence is given that the Gram reaction of bacteria depends upon the isolation range of their protoplasm. Mordants, such as Lugol's solution and  $K_2Cr_2O_7$ , act as oxidizing agents. Variability of bacterial strains is discussed.—*C. E. Skinner*.

1879. THJØTTA, T., AND E. GUNDERSEN. A streptothrix isolated from the blood in a case of acute rheumatism with remarks upon the classification of ray fungi. *Jour. Bact.* 10: 1–12. 9 fig. 1925.—A species of *Actinomyces* was found in the blood of a patient suffering from rheumatism. An incomplete description is given. The authors also discuss Ørskov's classification of the actinomycetes.—*C. E. Skinner*.

## PALEOBOTANY AND EVOLUTIONARY HISTORY

E. W. BERRY, *Editor*

(See also in this issue Entries 1419, 1431, 1472, 1477, 1725, 1835)

1880. ANONYMOUS. [Rev. of: GOODRICH, EDWIN S. *Living organisms: an account of their origin and evolution*. 200 p. Clarendon Press: Oxford; Oxford University Press: London, 1924.] *Nature* 116: 130. 1925.

1881. ANONYMOUS. [Rev. of: JEFFREY, E. C. *Coal and civilization*. xvi + 178 p. The Macmillan Co.: New York, 1925.] *Nature* 116: 93. 1925.

1882. ANONYMOUS. *Climates of the past*. [Rev. of: KÖPPEN, WLADIMIR, AND ALFRED WEGENER. *Die Klimate der geologischen Vorzeit*. (Climates of the geologic periods.) iv + 256 p. Gebrüder Borntraeger: Berlin, 1924.] *Nature* 116: 307–308. 1925.—The authors accept without hesitation some records which other writers regard as highly doubtful. The book will be more useful from its summary of little known facts than convincing of the author's theory.—*O. A. Stevens*.

1883. ANTEVS, ERNST. The climatologic significance of annual rings in fossil woods. *Amer. Jour. Sci.* 9: 296–302. 1925.—The author concludes from the botanical evidence that the absence or presence of growth rings has little climatic significance, that the distinctness of rings in conifers is largely specific, and that in all woody plants the sensitiveness of various species to climatic periodicity is quite variable. From this he argues that the presence or absence of rings in fossil woods indicates only that individuals are responsive or non-responsive to climatic periodicity. He then gives a resume of conditions met with in fossil woods of various ages, and seemingly in contrast to the conclusions just stated, he says that the marked rings in Jurassic woods from Spitzbergen and their absence in woods of the same age from East Africa indicate marked climatic zones. His major conclusion, derived entirely, however, from astronomical inferences, is that the earth through all time has had zonal climates.—*E. W. Berry*.

1884. BELLING, JOHN. On the origin of species in flowering plants. *Nature* 116: 279. 1925.

1885. BERRY, EDWARD W. A Miocene flora from Patagonia. *Johns Hopkins Univ. Studies Geol.* 6: 183-252. Pl. 1-9. 1925.—The author describes a flora of 36 species from Mirhoja, territory of Chubut, which is shown to be of Miocene age, and which indicates moister and more genial conditions than prevail at the present time in that latitude. The present flora of the Argentine is sketched and the environmental conditions indicated by this fossil flora are discussed. The following species are described as new: *Myrica mira*, *Celtis ameghenoi*, *Lomatites occidentalis*, *Peumus clarki*, *Leguminosites patagonicus*, *Erythroxyton cuneifolioides*, *Iceia tertiaria*, *Schinopsis patagonica*, *Maytenus latifolioides*, *Sapindus argentinus*, *Schmidelia graciliforma*, *eduliforma* and *proedulis*, *Cupania latifolioides* and *incerta*, *Rhamnidium preglabrum* and *patagonicum*, *Malvacarpus tertiarius*, *Sterculia patagonica*, *Tetracera patagonica*, *Banara prehernandiensis*, *Nectandra patagonica*, *Myrcia chubutensis*, *Styrax acuminatifomis*, *Arrabidaea patagonica*, *Bignonites ovatus*, *Strychnos mirhojana*, *Faramaea miocenica*, *Phyllites clarki* and *P. sloaneaformis*, *Carpolithus bivascularis*, *mirhojanus* and *patagonicus*. The genera *Peumus*, *Iceia*, *Schinopsis*, *Banara*, *Arrabidaea* and *Faramaea* are recorded as fossils for the first time.—*Author*.

1886. BERRY, EDWARD W. Tertiary plants from eastern Peru. *Johns Hopkins Univ. Studies Geol.* 6: 163-182. Pl. 1, 2. 1925.—The author describes the following plants, all new species, from Rio Aguaytia in eastern Peru, and considers them as probably Pliocene in age: *Trema micranthaformis*, *Momisia iguanaeformis* and *M. asperulaformis*, *Pithecolobium presaman*, *Cassia bassleri* and *C. aguaytiensis*, *Banisteria bassleri*, *Vallea prepubescens*, *Guazuma tertiaria*, *Tetracera tertiaria*, *Bignonia neogenia*, and *Bignonites americanum*. The species are all humid tropical and the genera *Trema*, *Vallea*, and *Guazuma* are recorded for the first time as fossils.—*Author*.

1887. BERRY, EDWARD W. The Tertiary flora of the Island of Trinidad, B. W. I. *Johns Hopkins Univ. Studies Geol.* 6: 71-162. Pl. 1-16. 1925.—The author describes a Miocene flora from the Caroni, Moruga, Morne l'Enfer and Forest sand formations of Trinidad. Of the 51 species recorded the following are described as new: *Palmocarpus fusiforme*, *Costus? incertus*, *Brosimum miocenicum*, *Inga kugleri*, *Cassia leptocarpoides*, *C. kugleri* and *C. zuliana*, *Canavalia miocenica*, *Leguminosites silvensis*, *L. canavaliformis* and *L. trinitensis*, *Fagara miocenica*, *Trichilia hirtaformis*, *Cedrela preodorata* and *C. tertiaria*, *Tapirira trinitiana*, *Anacardites americanus* and *A. spondiaformis*, *Maytenus trinitense*, *Colubrina miocenica*, *Rhamnidium miocenicum*, *Bombax prebarrigon*, *Rheedia miocenica*, *Calophyllum calabafomis*, *Persea preamericana*, *Nectandra kugleri* and *N. silvarenaria*, *Combretum incertum*, *Terminalia trinitense*, *Styrax? lehneri*, *Bumelia trinitense*, *Sideroxylon mastichodendroides*, *Mimusops miocenica* and *M. anomala*, and *Echites ettingshausenii*. This flora is a humid tropical flora, essentially South American rather than Antillean in its facies. The genera *Costus* and *Rhamnidium* are new to the fossil record.—*Author*.

1888. BERTSCH, KARL. Paläobotanische Untersuchungen im Reicheremoos. [Paleobotanical investigations in the Reicheremoos.] *Jahresh. Ver. Vaterl. Naturk. Württemberg Jahrg.* 80: 1-19. Pl. 1. 1924.—The author gives a detailed discussion of the peat sections near Waldburg in upper Swabia. The section is about 5 m. thick and rests on deposits of the Wurm glaciation. At the base is a glacial clay with *Potamogeton*, *Ranunculus*, *Sphagnum*, *Calliergon*, *Scorpidium*, *Equisetum*, *Phragmites*, *Carex*, *Myriophyllum*, *Menyanthes*, etc. Above this is a light mud with *Dryas octopetala*, *Salix reticulata*, *Salix waldsteiniana*, *Menyanthes*, etc., passing into a brown mud with *Betula nana*, *Scirpus*, *Potamogeton*, *Carex*, *Menyanthes*, mosses, etc., and this in turn passes into a peaty mud with *Betula pubescens* and *Pinus montana*. Above this is about 30 cm. of brown moss peat with many mosses, *Sphagnum*, *Carex*, *Eriophorum*, *Scirpus*, *Salix*, *Betula pubescens*, *Pinus silvestris*, *Potentilla*, *Lotus*, *Cicuta*, *Andromeda*, *Vaccinium*, *Menyanthes*, *Scutellaria*, etc. Above this is reed peat from 40 cm. to 2 m. thick with *Phragmites*, *Typha*, *Eriophorum*, almost no mosses, *Equisetum*, *Pinus*, *Carex*, *Salix*, *Corylus*, *Quercus*, *Ulmus*, *Potentilla* and *Ericaceae*, mostly represented by pollen. At the top of the reed peat is a layer of "birch peat" from 5 to 20 cm. thick, made up almost entirely of birch bark, but including traces of *Pinus*, *Picea*, *Scirpus*, *Carex*, *Corylus*, *Betula*, *Quercus*, *Ulmus*,



*Nymphaea*, *Tilia*, *Ericaceae*, etc. Above this is from 1 to 2 m. of *Eriophorum* peat, largely *E. vaginatum*, but including pollen and other traces of *Pinus*, *Picea*, *Abies*, *Betula*, *Quercus*, *Ulmus*, *Tilia*, *Alnus*, *Fraxinus*, *Corylus*, and *Ericaceae*. In places the *Eriophorum* peat is covered with up to 10 cm. of forest peat. Next above is a white moss peat some 10 cm. thick, with *Sphagnum medium*, *Andromeda*, *Vaccinium*, etc. This is overlaid by *Eriophorum* peat to a thickness of from 30 to 40 cm., above which is 10 cm. of forest peat with *Pinus*, *Picea*, *Abies*, *Quercus*, *Fagus*, *Ulmus*, *Betula*, *Alnus*, *Corylus*, *Carpinus*, and *Salix*. This is overlaid by about 1 m. of white moss peat, largely *Sphagnum*, above which is the recent living plant cover and its detritus. The time covered represents those stages and the correlated climates of the Scandinavian chronology from boreal, through Atlantic, sub-boreal and sub-Atlantic.—*E. W. Berry*.

1889. BEYLE, M. Über einige Ablagerungen fossiler Pflanzen der Hamburger gegend. [On fossil plant bearing beds in the vicinity of Hamburg.] Mitteil. Min.-Geol. Inst. Hamburg 2: 83-99. 1913; 5: 33-47. 1920; 6: 31-96. 1924.—During peat investigations around Hamburg the author discovered and studied many samples with identifiable plant remains. These are described and their contained floras are enumerated. The clay pits at Langenfelde near Altona yielded 46 species of a forest flora apparently interglacial in age. The other localities and the number of species enumerated from each are as follows: Hummelsbüttel, 12; Rübenkamp, 34; Eimsbüttel, 8; Barmbeck, 62; Blankenese, 45; Waltershof, 8; Ahrensburg, 65 diatoms and 26 higher plants; Schmalenbeck, 23; Wohldorf, 7; Lauenburg on the Elbe, 56; Ohlsdorf, 79. All are considered to be of Pleistocene age but there is considerable uncertainty regarding the precise horizons to which they should be allocated.—*E. W. Berry*.

1890. BOWER, F. O. The natural classification of ferns as a study in evolutionary methods. Nature 116: 136-138. 1925.—This group is unusually well suited to such study since it has many living species with a wide range of characters and is well represented by fossil species. The author outlines the criteria for comparison, the characters of a hypothetical primitive type, and the steps of progression from them. The characters of the primitive type are similar to those of the Rhynie chert fossils but it is not considered that any of these represent the actual ancestors.—*O. A. Stevens*.

1891. CAMPOS, JUAN D. A new specimen of *Lepidostrobus foliaceus*. Bot. Gaz. 79: 441-449. Pl. 30-32. 1925.—A description of an excellent specimen of the lycopodiaceous cone from the lower carboniferous formation, Gannister Horizon, Yorkshire, England.—*B. W. Wells*.

1892. CROOKALL, R. On the fossil flora of the Bristol and Somerset Coalfield. Pt. 2. Geol. Mag. 62: 385-410. Pl. 16-18. 1925.—In continuation of his printed studies of these coal fields the author lists the new records amounting to 444 species under the categories very common fairly common, very rare and fairly rare. He also describes and illustrates a considerable number of the more interesting forms. The paper closes with a chapter on the stratigraphy and correlation under the caption of Paleobotanical horizons. This constitutes an excellent outline of the plant zones of the British Coal measures.—*E. W. Berry*.

1893. FRITEL, P. H. Flores Permo-triasique et Carbonifère du Chan-Si central (Chine) d'après les matériaux rapportés par M. le Dr. A. F. Legendre. [Permo-Triassic and carboniferous floras from central Chan-Si, China, collected by Dr. A. F. Legendre.] Bull. Mus. Nation. Hist. Nat. 1925: 335-339. 1925.—This records the following species from several somewhat indefinite stratigraphic horizons in the province of Chan-Si, China: *Voltzia heterophylla*, *Noeggerathiopsis? hislopi*, *Schizoneura gondwanensis*, *Phyllothea robusta*, *Sphenophyllum aff. speciosum*, *Sphenopteris hughesi*, *S. polymorpha*, *Coniopteris arguta*, *Neuropteridium voltzi*, *N. validum*, *Danaeopsis hughesi*, and *Glossopteris communis*.—*E. W. Berry*.

1894. FRITEL, P. H. Sur la présence du genre *Rhizocaulon* Saporta dans les meulières de Beuce, aux environs de Paris. [The presence of the genus *Rhizocaulon* Saporta in the millstones of Beuce near Paris.] Bull. Mus. Nation. Hist. Nat. 1925: 118-120. 1925.—This records *Rhizocaulon brongniarti* Saporta, a monocotyledonous plant previously known from southeastern France, from Palaiseau and Verrière near Paris, in strata of upper Oligocene (Chattian) age.—*E. W. Berry*.

1895. GILKINET, A. Flore fossile du Landénien de Huppaye Eocène inférieur. [Fossil

flora of the lower Eocene or Landenian of Huppaye.] Mém. Soc. Géol. Belge 1924-1925: 1-28. Pl. 1-6. 1925.—The author describes the following plants from the locality and horizon cited: *Acrostichum affine*, *Lygodium kaulfussi*, *Sequoia coulttsiae*, *Podocarpus eocenica*, *Nipaditis burtini*, *Myrica longifolia*, *M. banksiaefolia*, *M. hakeaefolia*, *Ficus apocynophylla*, *Dryandra schrankii*, *Daphnogene ungeri*, *Laurus primigenia*, *Andromeda protogaea*, and *Eucalyptus oceanica*.—E. W. Berry.

1896. GILKINET, A. Un cône fossile du Rupélien. [A fossil cone from the Rupelian.] Mém. Soc. Géol. Belge 1924-1925: 29-31. Fig. B. 1925.—This describes a cone from an unknown locality in the Oligocene of Belgium indistinguishable from that of the existing *Pinus laricio*, and referred to the var. *thomasiana* of Heer, probably coming from the plastic clay of Andenne.—E. W. Berry.

1897. GLAUERT, L. Notes on fossil plants from Mingenew and Irwin River. Jour. and Proc. Roy. Soc. Western Australia 10: 7-11. 1925.—Plant remains from the Jurassic at Mingenew and from the Permo-Carboniferous at Irwin River are listed. *Otozamites feistmanteli* Zigno, *Pagrophyllum* sp., *Phyllothea* sp., *Sphenopteris lobofolia* Morris, *Glossopteris Browniana* Brong., *G. indica* Schimper, *G. ampla* Dana, *Gaugamopteris* sp. and *Noeggerathiopsis* sp. are recorded.—Wm. Randolph Taylor.

1898. GOTHAN, W. Das Vorkommen von Kautschukbäumen in der Braunkohle. [The presence of rubber trees in the brown coal.] Ber. Deutsch. Bot. Ges. 43<sup>2</sup>: 87-90. 1925.—This is a brief statement of the results of a study of the so-called "Affenhaar" of the Cöthener brown-coal, of Eocene age. These, formerly thought to be bast fibers, are shown to be rubber. There is also a summary of the fossil occurrences of gums—Helenite, Ozokerit, etc.—E. W. Berry.

1899. GOTHAN, W. Ein Beitrag zur Kenntnis des Aachener Oberkarbons. [A contribution to the understanding of the Aix-la-Chapelle upper Carboniferous.] Glückauf 35: 1-12. 1925.—A new study of the coal measures at Aachen, with a wealth of interesting local details. The measures are divided into a lower Stolberger group, a middle Kohlseider group, and an upper Alsdorfer group, representing the lower and middle parts of the upper Carboniferous. The horizons are correlated with those of Belgium, Holland and the Ruhr. Numerous fossil plants are listed, especially from the Alsdorfer group.—E. W. Berry.

1900. GOTHAN, W. Ruhrkarbon und Osnabrücker Karbon. [Carboniferous of the Ruhr and Osnabruck fields.] Glückauf 35: 777-779. 1925.—A short note of additions to our paleobotanical knowledge and to the correlation between these 2 coal fields. The author concludes that the lower horizons at Ibbenbüren are absent in the Ruhr District.—E. W. Berry.

1901. GOTHAN, W. Studien über die Bildung der Schwelkohle und des Pyropissits. [Studies on the formation of Bitumen- and Tar-coal.] Abhandl. Braunkohlen u. Kali Indust. 6: 1-42. Pl. 1-3. 1925.—This is an account of a study of the conditions under which bitumen-rich coals were formed in the older German browncoal. The author concludes that they are a result of the exposure and drying of the upper part of the moor during its formation, and the consequent oxidation and weathering of the humus constituents and the resulting enrichment of the residue in bituminous products forming the so-called "Schwelkohle" and still more tarlike pyropissit.—E. C. Roschen.

1902. GOTHAN, W., UND E. KINDSCHER. Über die Haarkohle der Cöthener Braunkohle, der Geiselthalkohle und der Ober-Röblinger Kohle. [The hair coal of the Cöthener, the Geisel Valley and the upper Röblinger Browncoal.] Centralb. f. Mineral. Geol. u. Paläontol. 1925B: 52-60. Pl. 1-3. 1925.—A more detailed account of the hair-coal (see this issue, Entry 1898). These masses of hair-like material are proved by chemical analysis to be rubber, indicating the presence of appropriate vegetation for their origin. They are rather characteristic of the older German browncoal (Eocene), but have not been detected in the younger browncoal (Miocene). Localities and all the more important details are given at length.—E. W. Berry.

1903. GRAHMANN, R. Über pflanzenführende Diluvialtone in Nordwestsachsen. [Plant bearing Pleistocene clays in northwestern Saxony.] Zeitschr. Deutsch. Geol. Ges. 76: 138-158. Pl. 2. 1924.—The author enumerates 15 mosses and 17 other plants from the terrace deposits at Pöhlen in Saxony, concluding that they indicate a tundra swamp environment and belong near the beginning of the 2nd glacial stage of the Pleistocene.—E. W. Berry.



1904. HOWE, M. A., AND M. I. GOLDMAN. *Lithothamnium* (?) *ellisianum* sp. nov. from the Jurassic Ellis formation of Montana. Amer. Jour. Sci. 10: 314-324. Pl. 1-11. 1925.—The geological section is described. The algae occur in a 6-inch layer at the top of limestones and below calcareous shales in the lower part of the Ellis formation. They constitute concretionary masses 1-6 cm. in diameter, and show narrow concentric layers with some proliferations. The problematical cell structure is less regular than in Tertiary *Lithothamnium*s and is possibly due to secondary silicification. Certain elliptical openings seen in the sections appear to represent conceptacles.—E. W. Berry.

1905. KIDSTON, R., AND W. H. LANG. Notes on fossil plants from the Old Red Sandstone of Scotland. II. *Nematophyton forfarense* Kidston sp. III. On two new species of *Pachytheca* (*P. media* and *P. fasciculata*) based on the characters of the algal filaments. Trans. Roy. Soc. Edinburgh 53: 603-614. Pl. 1-2. 1925.—In the 1st part the authors redescribe *Cryptoxylon forfarense* Kidston, 1897, and show that it represents a species of *Nematophyton* with medullary spots. In the 2nd part 2 new species of the somewhat problematic genus *Pachytheca* are described in detail, the diagnosis being based upon the character of the algal filaments of which they are constituted. Both are from the lower Old Red Sandstone of Scotland. The genus is redefined and all of the Silurian and Devonian species are listed. It is tentatively considered as a colonial alga and is compared with certain *Cladophoraceae* and *Cyanophyceae*.—E. W. Berry.

1906. KIDSTON, R., AND W. H. LANG. On the presence of tetrads of resistant spores in the tissue of *Sporocarpion furcatum* from the upper Devonian of America. Trans. Roy. Soc. Edinburgh 53: 597-602. Pl. 1. 1925.—The authors describe specimens of this plant from the upper Devonian black shales of Ohio. The remains are flattened, forked, distal portions of some plant, and apparently isolated within their tissue are tetrads of cuticularized spores. The authors conclude that *Sporocarpion furcatum* probably represents the fertile tips of some thalloid plant and not the sporangia of some higher plant, although they might represent some exceedingly primitive thalloid Pteridophyte, as yet otherwise unknown.—E. W. Berry.

1907. KOZŁOWSKA, ANIELA. Diluvian flora of Poland. Bot. Gaz. 77: 186-198. Fig. 1-5. 1924.—Fossil elements of *Tsuga canadensis* are described from the Czarna River region as of Riss-Wurm age. This species, though not now present, occurred with many others (*Fagus silvatica*, *Abies pectinata*, etc.) still living in northern Europe today. The distribution of fossil and living material of *Brasenia purpurea*, *Dulichium spathaceum*, and *Fraxinus Americana* is described, all of which plants were formerly in Europe but are now found only in America.—B. W. Wells.

1908. KRÄUSEL, R. Neuere Arbeiten über die Devonflora. [Recent contributions to the Devonian Flora.] Neuen Jahrb. 1925<sup>1</sup>: 150-156. 1925.—This gives a brief account of the recent contributions to this subject by Arber, Edwards, Gilkinet, Goldring, Grüss, Kidston and Lang, Kräusel and Weyland, Posthumus, and some others of minor importance.—E. W. Berry.

1909. KRÄUSEL, R. Zur "Sumpfmooornatur" der mitteldeutschen Braunkohle. [The "swamp moor nature" of the middle German Brown-coal.] Centralbl. f. Mineral. Geol. u. Paläontol. 1925B: 146-151; 166-170. 1925.—A summary of the probable ecology of the Tertiary plant cover which formed the German brown-coal deposits, a subject of considerable recent differences of opinion, is given. The author concludes, from various lines of evidence, that the idea that the brown-coal was a swamp deposit and comparable to the present Dismal Swamp is entirely false.—E. W. Berry.

1910. NOÉ, A. C. Dakota sandstone plants from Cimarron County, Oklahoma. Oklahoma Geol. Surv. Bull. 34: 93-107. Pl. 19-24. 1925.—The author records unidentified stems and seeds, and the following named plants from the supposed Dakota sandstone of Cimarron County, Oklahoma: *Alismophyllum victor-masoni*, *Salix flexuosa*, *Quercus groenlandica*, *Platanus guillelmae*, *Sterculia snowii*, and *S. mucronata*.—E. W. Berry.

1911. PIA, JULIUS. Einige Dasycladaceen aus der Obertrias der Molukken. [Some Dasycladaceae of the upper Triassic of the Moluccas.] Jaarb. Mijnnw. Nederland. O. Indie 52: 139-150. Pl. 1. 1923 [1925].—The author describes *Macroporella sondaica* n. sp., and *Sestrosphaera* ? n. sp. from East Seran, and *Macroporella irregularis* n. sp. from West Buru, from beds of upper Triassic age.—E. W. Berry.

1912. PIA, JULIUS. Einige neue oder ungenügend bekannte Siphoneae verticillatae aus dem mitteleuropäischen Malm. [New or little known verticillate Siphoneae from the Malm of middle Europe.] Ann. Naturhist. Mus. Wien 38: 82-88. Pl. 1. 1925.—*Gyroporella supra-jurassica* Gümbel and *G. pygmaea* Gümbel from the upper Jurassic of Bavaria are re-described and referred, respectively, to the genera *Uragiella* and *Macroporella*. Specimens from the Rauracian stage in the Meuse are described as *Myrmekioporella mosana* n. sp., and *Griphoporella irregularis* n. sp.—E. W. Berry.

1913. SCHAFFNER, J. H. Main lines of evolution in Equisetum. Amer. Fern Jour. 15: 8-12, 35-39. Pl. 3. 1925.—The author finds, from a study of fossil and living forms, the evolutionary development to be the reverse of that commonly held. *Equisetum xylochaetum* and *E. gigantum* are the lowest of the series while *E. telmateia* and *E. arvense* are the highest.—E. R. Walker.

1914. SCHÖNFELD, G. Das Taxodium unserer Braunkohlenwälder. [The Taxodium of our Brown-coal forests.] Senck. 7: 1-8. Pl. 1-5. 1925.—This is an anatomical study of the bald cypress, the Mexican cypress and the cypress of the German Tertiary brown coal, *Taxidioxylon taxodii* Gothan, as it is usually termed. The author finds that the existing forms differ slightly in the anatomy of the pith cells, those of *Taxodium mexicanum* being thicker walled than those of *Taxodium distichum*. He concludes that the former is not a distinct species, but merely an ecological variety of the latter, growing in drier soil, and since the pith in the Tertiary form is more like this Mexican variety, he believes that this is an additional argument against the notion that the forests which produced the brown coal were swamp forests.—E. W. Berry.

1915. STEINMANN, G. Über Lycopodiopsis. Palaeontol. Zeitschr. 6: 257-263. Pl. 9. 1924.—The author redescribes *Lycopodiopsis derbyi* Renault of the Permian of São Paulo, Brazil, from new sections, and concludes that it belongs to the Lepidodendraceae and probably represents a type peculiar to the Glossopteris flora of South America.—E. W. Berry.

1916. TUBEUF, K. VON. Monographie der Mistel. [Monograph of the mistletoe.] 832 p. 35 pl., 5 maps. R. Oldenbourg: Munich and Berlin, 1923.—In this exhaustive account of the living species the author gives the following occurrences of the existing European species in a fossil state in pre-glacial, interglacial and post-glacial deposits: Lauenburg on the Elbe, Winterbecker Way near Kiel, Kuden, and in the Swiss Lake dwelling deposits at Moosseedorf.—E. W. Berry.

1917. WALTON, JOHN. On a calcareous alga belonging to the Triploporellidae (Dasycladaceae) from the Tertiary of India. Rec. Geol. Surv. India 56: 213-219. Pl. 16. 1925.—The author describes the segments of *Triploporella ranikotensis* n. sp., from the Ranikot beds (lower Eocene) of the Sind.—E. W. Berry.

1918. WEISE, E. Pflanzenführende Schichten im vogtländischen unteren Kulm. [Plant bearing beds in the Lower Carboniferous of Vogtland.] Zeitschr. Deutsch. Geol. Ges. 76: 267-268. 1924.—The author records the following species from the region and horizon cited in the title: *Archaeocalamites radiatus*, *Lepidodendron veltheimianum*, *Lepidostrobus*, *Sphenophyllum*, *Rhodea patentissima*, *R. moravica*, *Cardiopteris frondosa*, *C. hochstetteri*, *Archaeopteris tschermaki*, *Adiantides tenuifolius*, *A. machaneki*, *A. antiquus*, *Cycadopteris antiqua*, and *Rhacopteris transitionis*.—E. W. Berry.

## PATHOLOGY

FREDERICK V. RAND, *Editor*

LILLIAN C. CASH AND HARRY BRAUN, *Associate Editors*

(See also in this issue Entries 1337, 1338, 1339, 1340, 1352, 1372, 1378, 1392, 1396, 1439, 1446, 1449, 1471, 1485, 1503, 1510, 1512, 1520, 1561, 1570, 1578, 1581, 1582, 1586, 1594, 1596, 1602, 1603, 1604, 1608, 1612, 1613, 1614, 1617, 1618, 1621, 1626, 1627, 1628, 1632, 1641, 1673, 1688, 1718, 1751, 1770, 1775, 1777, 1779, 1781, 1782, 1784, 1808, 1809, 1813, 1819, 1829, 1854, 1858, 1860, 1863, 1865, 1875, 1876, 1916, 2031, 2055, 2064, 2077, 2099, 2101, 2124, 2129)

## DISEASES CAUSED BY FUNGI

1919. ANONYMOUS. Corn breeding yields results. Purdue Univ. [Indiana] Agric. Exp. Sta. Circ. 128. 1-12. 8 fig. 1925.—This is a popular account of recent results obtained by G. N. Hoffer and associates in the control of corn root, stalk and ear rots.—M. W. Gardner.



1920. ANONYMOUS. To control blue mould of tobacco. Agric. Gaz. New South Wales 36: 624. 1925.—In the control of this disease (*Peronospora* sp.), it is suggested that a number of seed beds be prepared, seeded at intervals, with care as to amount of water, air and sunlight. If one or more beds become infected, the plants in such beds should be destroyed immediately. Early transplanting is advised.—*L. R. Waldron*.

1921. BAILEY, D. L. Report of Dominion Field Laboratory of Plant Pathology, Winnipeg, Manitoba. Canada Dept. Agric. Exp. Farms, Div. Bot. Rept. 1923: 24–28. 1924.—The following projects were commenced: Oat stem-rust investigations, varietal resistance of oats to crown rust, epidemiology of black stem rust, control of cereal smuts, Rhamnus and barberry surveys, and root rots of wheat.—*T. G. Major*.

1922. BARGER, WILLIAM R., AND LON A. HAWKINS. Borax as disinfectant for citrus fruit. Citrus Indust. 6<sup>o</sup>: 8–9, 24. 1925.—(See also Bot. Absts. 14, Entry 7951.)

1923. BAUDYŠ, E., AND J. ŘÍHA. Vliv předčasného sežínání natě na produkční schopnost sádky bramborové. [Effect of early removal of vines on the yield of potatoes.] Ústav pro zdravotnou rostlin, Moravských Zem. Výz. Úst. Zeměl., Brno, [Phytopath. Sect. Moravian Agric. Exp. Sta., Brno Circ.] 35. 1–4. 1924; (also Československy Zemědělec 1924).—To prevent the spores of certain leaf diseases from getting into the soil some investigators recommend the removal of vines before potatoes are ripe. The authors made experiments to test the effect of this removal on yield and found that potatoes which had vines removed yielded much less than the controls.—*M. Demerec*.

1924. BIRMINGHAM, W. A., AND H. A. MILLS. Experiments for the control of black spot of apple. Due to the fungus *Venturia inaequalis* (Cke.) Aderh. Agric. Gaz. New South Wales 36: 665–666. 1925.—Sprays used were Bordeaux (6–4–50) and lime-sulphur mixtures. Best control was secured when Bordeaux was sprayed between early spur-burst and pink stages, followed by Bordeaux at calyx stage. The next best control was secured by early use of Bordeaux followed by lime-sulphur at calyx stage. Lime-sulphur sprayed at the 2 stages gave least control. Using 2 Bordeaux sprays, russetting was slight to pronounced, without fruit cracking. No russetting occurred with lime-sulphur sprays.—*L. R. Waldron*.

1925. BROOKS, F. T. Silver-leaf disease of the fruit trees. Jour. Ministry Agric. Great Britain 31: 954–957. 1925.—Silver leaf (*Stereum purpureum*) of plum and apple trees is one of the most serious diseases of fruit trees in Britain. Control is effected by plant sanitation, including burning of woody material harboring the fungus and pruning in such a way as to avoid large wounds on older trees. Vigorously growing trees are more likely to throw off the disease; thus, growing the crops under the most suitable soil conditions helps to keep this disease within bounds.—*M. B. McKay*.

1926. BROWN, NELLIE A. A note on a rot of the Smyrna fig in California. Science 62: 288. 1925.—The name of the fungus that was mentioned in the recent paper by Caldis (Science 62: 161. 1925) should be *Fusarium moniliforme* Sheldon. The typical curved septate spores preclude listing it as an *Oospora*.—*C. J. Lyon*.

1927. BURK. Zur Steinbrandbekämpfung des Weizens. [Control of wheat bunt.] Zeitschr. Pflanzenkrankh. 33: 193–240. 1923.—The author discusses work done previously by other authors relating to prevention of smut through seed certification, breeding, and cultural measures. This is followed by a chapter on seed treatment which gives results obtained with Uspulun, Tillantin B., Segetan I and II, and Germisan. Summarizing the results, the conclusions are that if correctly employed, all these substances will prevent smut in wheat treated previously to sowing.—*H. T. Güssow*.

1928. DRECHSLER, CHARLES. Pythium infection of cabbage heads. Phytopathology 15: 482–485. Fig. 1. 1925.—A cabbage head showing a water-soaked appearance of the central portion of the head was obtained from the Washington market. The leaves were firm to the touch but the inner portion of the stem and of the leaf midribs showed a watery soft rot. A species of *Pythium* was isolated from the decaying tissue and inoculation tests proved it capable of reproducing the decay. The fungus is not definitely identified but is said to belong to the *P. debaryanum* group.—*B. B. Higgins*.

1929. ERIKSSON, J. Phytopathologische Mitteilungen I. [Phytopathological notes I.] Arkiv Bot. 19<sup>o</sup>: 1–29. 12 fig. 1924.—The 1st part of the work deals with bean anthracnose

(*Collectotrichum Lindemuthianum* (Sacc. & Magn.) Briosi & Cav.). The author was unable to find any spores or other traces of fungi outside or within the beans investigated. These beans, nevertheless, after sowing gave plants that showed the disease. Control plants from another source did not show the disease. The author concludes that the infection is carried over somehow in the interior of the beans. The disease, once present in the plants, was found to have a restricted power of infecting other plants in the vicinity. The author gives a review of the experiments made in different countries on the disease, which seem to confirm his own view. He is inclined to explain these facts with the aid of his mycoplasma theory.—The 2nd part deals with bean-rust (*Uromyces appendiculatus* (Pers.) Link). The author draws attention to the relatively rare occurrence of aecidia. They are principally found either early in the year or late in summer, simultaneously with uredo- and teleutospores. The author wishes to explain the fact that the disease appears very late after sowing, on the assumption that the disease is carried over in the interior of the beans. Furthermore, some cases are reported of late, isolated appearance of *Peronospora Schachtii* Kühn. on beets, explained in a similar way. Finally, some notes are given on *Fusarium Willkommii* Lindau on apples.—O. Heilborn.

1930. EZEKIEL, WALTER N. Presence of the European brown-rot fungus in America. *Phytopathology* 15: 535-542. Fig. 1-3. 1925.—Results re reported from comparative cultural and inoculation studies of *Sclerotinia cinerea* (Bon.) Schroter, *S. americana* (Wormald) Norton & Ezekiel, and various isolations of *Monilia* from Oregon and California, including a culture of *Monilia oregonensis* Barss & Posey. All of the Oregon and California cultures except one from apricot appear to be identical with *S. cinerea*. *S. cinerea* attacks twigs and woody parts of the hosts more frequently than *S. americana*; but, because of the sparsity of conidia during the summer and slow growth in the fruit, it is not so important as *S. americana* as a fruit-rotting organism. Methods are outlined through which *S. cinerea* can be differentiated from *S. americana* by cultural characteristics as well as by numerous mycelial characteristics shown in hanging drop cultures.—B. B. Higgins.

1931. FRASER, W. P. Report of the Saskatoon Laboratory of Plant Pathology in co-operation with the University of Saskatchewan, and the Dominion Laboratory at Indian Head. Canada Dept. Agric. Exp. Farms, Div. Bot. Int. Rept. 1920-1921: 93-107. 1921.—In addition to notes on the occurrence of a number of diseases, progress is reported in projects on the effect of stem rust on different varieties of wheat and emmer, life history and control of western rye-grass smut, overwintering of uredospores of stem rust, seed treatment of cereals by the dry method, first appearance of stem rust, stripe disease of barley, and strains of stem rust on wheat. A barberry and buckthorn survey was carried out in Saskatchewan and a barberry survey in Manitoba.—T. G. Major.

1932. FRASER, W. P. Report of the Dominion Field Laboratory, Saskatoon, in coöperation with the University of Saskatchewan, and the Field Laboratory at Indian Head. Canada Dept. Agric. Exp. Farms, Div. Bot. Rept. 1921-1922: 61-72. 1922.—Field experiments were conducted to determine the effect of stem rust on different varieties of wheat and emmer and the biologic forms which will develop under varying conditions. Work was continued on the collection of biologic strains of rust, overwintering of uredospores, first appearance of stem rust, and time of cutting rusted grain. The results are given of experiments on the control of grain smuts by dusts, dry formalin, and "Gas Grain Pickler" methods.—T. G. Major.

1933. FRASER, W. P. Report of the Dominion Field Laboratory of Plant Pathology at Saskatoon, in co-operation with the University of Saskatchewan, and the Dominion Field Laboratory at Indian Head. Canada Dept. Agric. Exp. Farms, Div. Bot. Rept. 1922: 43-63. Fig. 6. 1923.—Experiments were continued on various phases of the wheat stem-rust problem. Formaldehyde and copper carbonate gave the most satisfactory control of bunt of wheat. In the case of smut on Liberty oats it seems that dusting with copper carbonate would be efficient, provided the seed is not heavily smutted.—T. G. Major.

1934. FRASER, W. P. Report of the Dominion Field Laboratory of Plant Pathology in co-operation with the University of Saskatchewan. Canada Dept. Agric. Exp. Farms, Div. Bot. Rept. 1923: 38-48. 1924.—Strains of the Marquis × Iumillo cross showed promising results in tests of stem-rust-resistant varieties. Ten physiological strains of *Puccinia graminis tritici* have been isolated in Western Canada. The Peace River District of Alberta was found to be



free of rust. A large number of dust and liquid treatments were tested in the control of wheat bunt, oat smut, and barley smut. All except Furfural gave satisfactory results.—*T. G. Major.*

1935. GARBOWSKI, J. Rak ziemniaczany (*Synchytrium endobioticum* Perc.) w Polace. [Potato wart in Poland.] Choroby i Szkodniki Roślin 1925<sup>2</sup>: (1-14). 1925.—The paper discusses the discovery in 1924 of 3 new centers of potato wart infection in Silesia. The actual distribution of the disease is shown on a map. The importation of potatoes into the country is restricted to those certified by phytopathological institutes.—*L. C. Cash.*

1936. GARDNER, MAX W. Cladosporium spot of cowpea. Phytopathology 15: 453-462. Pl. 21-23. 1925.—An apparently undescribed disease of cowpea (*Vigna sinensis* Endl.) has been found occurring on the Early Buff variety in the variety test plats at the Indiana Agric. Exp. Sta. Conspicuous, purple to black, scabby spots 2-6 mm. in diameter are produced on the seed pods. In the older spots the center is often tan or gray and covered with the greenish sporulation of a *Cladosporium*. On the peduncles and growing tips of the stems the spots are sunken, elliptical to lens-shaped, 1 to 6 mm. in length, and dark purple in color. Similar spots occur on the petioles and main veins of the leaves, while on the leaf blades the spots are small, 0.5-1 mm. in diameter, circular, sunken, and tan colored with a dark purple or maroon border. The *Cladosporium* found sporulating on the spots was isolated and grown in pure culture. Spores from these cultures were used in making numerous successful inoculations. Only the very young immature tissues were found susceptible. On the immature portions small water-soaked spots appeared 48 hours after inoculation and after a few days these spots assumed the characteristic color and shape noted in the field. The fungus is seed-borne by means of the mycelial infection of the seed-coat from the pod spots and, apparently, also by the surface contamination of seed with spores of the fungus. The causal organism is designated as *Cladosporium vignae* n. sp. and a technical description is given.—*B. B. Higgins.*

1937. GILL, LAKE S. Notes on sporophores of *Polyporus schweinitzii* Fr. on yellow pine in California. Phytopathology 15: 492-493. 1925.—An account is given of the collecting of 3 specimens of *Polyporus schweinitzii* on living trees of *Pinus ponderosa*, which tends to confirm the previous suspicion that this fungus is responsible for a carbonizing heart-rot of the western yellow pine.—*B. B. Higgins.*

1938. GRAVATT, G. F. Status of the chestnut blight. Rept. Proc. Tenth Ann. Blister Rust Conf., Washington, D. C., Feb. 18-23, 1925. [Mimeographed.] P. 77-84. 1925.—The article deals with the loss of chestnut timber due to lack of early utilization of trees infected with blight. Data obtained in a survey of the southern Appalachians are given.—*L. C. Cash.*

1939. GÜSSOW, H. T. Wheat rust. Canada, Parliamentary Session 1924, Select Standing Committee on Agriculture and Colonization. (Separate of address.) 25 p. 1924.—The tremendous annual losses are emphasized, the organization of the investigations on cereal rusts is described, and suggestions are made for further expansion of the work.—*T. G. Major.*

1940. HAHN, G. G. Methods of identifying blister rust by inoculating *Ribes* in the greenhouse. Rept. Proc. Tenth Ann. Blister Rust Conf., Washington, D. C., Feb. 18-23, 1925. [Mimeographed.] P. 70-71. 1925.—These 2 rusts can be differentiated in the uredo stage by inoculation tests. Certain species of *Ribes* and *Grossularia* are susceptible to the white pine blister rust and resistant or immune to the pinon blister rust. In no case was the reverse found to be true. A number of varieties of *Ribes vulgare* have shown themselves constant hosts in being susceptible to the white pine blister rust and resistant to the pinon rust. Among these, the widely grown variety, Fay's Prolific, and the common white variety, White Grape, have proved to be excellent varieties for this differential inoculation test. These results supplement microscopical differences.—*L. C. Cash.*

1941. HEDGCOCK, G. G., G. F. GRAVATT, AND R. P. MARSHALL. *Polyporus schweinitzii* Fr. on Douglas fir in the eastern United States. Phytopathology 15: 568-569. 1925.—*Polyporus schweinitzii* was found doing considerable damage in a plantation of young Douglas fir (*Pseudotsuga taxifolia* (Lam.) Britt.) at Biltmore, North Carolina.—*B. B. Higgins.*

1942. ILLICK, J. S. Will the chestnut come back? Amer. Forests and Forest Life 31: 7-9. 5 fig. 1925.—This article deals with 2 mature chestnut trees in the towns of Milroy and Gap, Pennsylvania, which so far have resisted the chestnut blight, and with the experiments of Zimmerman in Dauphin County, Pennsylvania, which may lead to blight-resistant stocks or strains.—*Chas. H. Otis.*

1943. JONES, L. R., J. C. WALKER, AND JOHN MONTEITH, JR. **Fusarium resistant cabbage: Progress with second early varieties.** Jour. Agric. Res. 30: 1027-1034. 2 pl. 1925.—The increasing range and importance of cabbage yellows in the U. S. A. is emphasized, while the successful use of the 3 strains produced earlier—Wisconsin Hollander, Wisconsin All Seasons, and Wisconsin Brunswick—is pointed out. The work now under way is concerned with selections from intermediate varieties—All Head Early, Glory of Enkhuizen, and Copenhagen Market. The present paper is a report of progress with these selections. Although the lines have not yet reached a finished state it is believed that they are approaching commercial value and will in due time find their place in commercial seed trade channels.—J. C. Walker.

1944. KEMPTON, F. E. **Barberry eradication as a method of reducing stem rust losses of small grains.** Rept. Proc. Tenth Ann. Blister Rust. Conf., Washington, D. C., Feb. 18-23, 1925. [Mimeographed.] P. 35-60. 1925.—The following subjects are treated: The life history of the stem rust parasite, overwintering of the red stage, stem-rust spread, means of reducing stem-rust losses, the common barberry, appropriations for barberry eradication, organization and cooperation, publicity and education, surveys, eradications, investigations, regulatory work, checking of methods used to assure effective results, and summary of results for 7 years.—L. C. Cash.

1945. LÖHNIS, MARIE P. **Onderzoek naar het verband tusschen der weersgesteldheid en de aardappelziekte (Phytophthora infestans) en naar de eigenschappen, die de vatbaarheid der knollen voor deze ziekte bepalen.** [The relation between weather conditions and the occurrence of potato blight and factors determining the degree of susceptibility of the tubers to the disease.] (English summary.) Mededeel. Wetenschap. Comm. voor Advies en Onderzoek Belang Volkswelvaart en Weerbaarheid. 129 p. Pl. 1-11, fig. 1-15. [1924?].—The following subjects were investigated: Relation between weather conditions and the progress of an epidemic of blight on potatoes; field experiments for the determination of the moment at which spraying with Bordeaux mixture gives the best results; the infection of tubers and their degree of resistance; investigation of the nature of the factor which may cause the resistance of the cork-cambium; anatomical investigation of the mode of entrance through the eyes; investigations as to the moment at which potato tubers become infected; and degree of susceptibility in the foliage.—L. C. Cash.

1946. McC., A. W. **Forest pathology.** Canada Dept. Agric. Exp. Farms, Div. Bot. Rept. 1923: 8-12. Pl. 2. 1924.—The white pine blister rust survey was continued in Nova Scotia, New Brunswick, Quebec, Ontario and British Columbia. It was found that feather rot (*Poria subacida*?) and red heart rot (*Stereum sanguinolentum*) were the chief decays of balsam in the Lake St. John district of Quebec.—T. G. Major.

1947. McCALLUM, A. W. **Forest pathology. White pine blister rust.** Canada Dept. Agric. Exp. Farms, Div. Bot. Int. Rept. 1920-1921: 12-16. 1921.—A survey of the Timigami forest reserve showed the prevalence of a white pine leaf blight of unknown etiology, heart-rots caused by *Polyporus Schweinitzii*, *Trametes pini*, and *Fomes pinicola*; and *Napicaldium tremulae* on *Populus* spp. The work on white pine blister rust from 1915 to 1920 included intensive surveys, Ribes eradication, and the establishment of control areas.—T. G. Major.

1948. McCUBBIN, W. A. **Apple rust and its control.** Pennsylvania Dept. Agric. Gen. Bull. 411. 1-10. Fig. 1-5. 1925. (Bull. Pennsylvania Dept. Agric. 8<sup>45</sup>. 1925.)

1949. McCUBBIN, W. A. **Peach canker.** Canada Dept. Agric. Bull. 2nd Ser. 37. 1-20. Pl. 1-6. 1918.—The canker fungus, *Valsa leucostoma* (Pers.) Fr., establishes itself in some dead portion of the tree and then attacks the surrounding living tissue. As a result there is a heavy flow of gum which stimulates the tissues to excessive growth, thereby forming a callus ring around the canker. This in turn is invaded by the fungus when the tree is dormant. The process continues each season until the limb is girdled. The cankers should be moved after a summer rain, washed out with corrosive sublimate and, when dry, the exposed heart-wood should be covered with lead paint. Any subsequent gum exudations should be rubbed off.—T. G. Major.

1950. McKINNEY, H. H., AND R. J. DAVIS. **Preliminary environmental studies of the take-all disease of wheat caused by *Ophiobolus graminis* Sacc.** Phytopathology 15: 494-495. 1925.—The results of greenhouse tests on the effect of temperature and soil moisture on the



development of the disease are reported briefly. Some infection occurred at all temperatures tried, 8°–32°C; but injury was greatest at 12°–16°C. With favorable temperatures, infection occurred at all soil moistures, but the greatest amount of disease occurred in soils containing the highest percentages of water.—*B. B. Higgins.*

1951. REED, GEO. M. The inheritance of resistance of oat hybrids to loose smut. *Mycologia* 17: 163–181. 1925. (For abstract see this issue, Entry 1698.)

1952. ROSEN, H. R. *Fusarium vasinfectum* and the damping off of cotton seedlings. *Phytopathology* 15: 486–488. 1925.—Field observations, as well as laboratory and greenhouse tests, indicate that *Fusarium vasinfectum* Atk. may prevent proper germination of planted cotton seed and also cause sore-shin and damping-off of the seedling plants.—*B. B. Higgins.*

1953. SALMON, E. S., AND W. M. WARE. Apple and pear scab. *Jour. Ministry Agric. Great Britain* 31: 546–554. 8 fig. 1924.—For the first time in England the winter or perfect stage of apple and pear scab (*Venturia inaequalis* and *V. pirina*) has been collected and recognized. The perithecia were found on the old, overwintered leaves on the ground, as commonly found in most if not all other apple and pear growing countries. Formerly these organisms were known to overwinter in England only by means of the *Fusicladium* stage on young diseased twigs on the trees.—For control, where practicable it is recommended that the old leaves be removed and destroyed in the fall or deeply buried and a spray program be followed in which 3 applications of Bordeaux mixture or lime sulphur are used. In some cases the use of a dormant lime-sulphur spray on pears may be justified. In addition, as much as possible of the diseased wood should be cut out in pruning.—*M. B. McKay.*

1954. SIMMONDS, P. M. Report of the Dominion Field Laboratory of Plant Pathology, Indian Head, Saskatchewan. *Canada Dept. Agric. Exp. Farms, Div. Bot. Rept.* 1923: 49–53. 1924.—Cultural and inoculation experiments demonstrated the pathogenicity of a species of *Fusarium* as the cause of a wilt disease of oats.—*T. G. Major.*

1955. SNELL, WALTER H., NATHANIEL O. HOWARD, AND MYRON U. LAMB. The relation of moisture contents of wood to its decay. *Science* 62: 377–379. 1925.—The following fungi were tested for growth upon timber of Sitka spruce, Southern pine sapwood and Douglas fir: *Lenzites sepiaria*, *L. trabea*, *Trametes serialis*, *T. carnea*, *Fomes roseus* and *Lentinus lepideus*. Preliminary results show that the moisture content that allows maximum decay or that inhibits decay, varies inversely with the specific gravity. On the physiological basis it means that the hard woods are durable because of the small amount of air contained in their lumina, available for fungous growth.—*C. J. Lyon.*

1956. SPAULDING, P. Longevity of blister rust teliospores and sporidia. *Rept. Proc. Tenth Ann. Blister Rust Conf., Washington, D. C., Feb. 18–23, 1925.* [Mimeographed.] P. 72–73. 1925.—How long sporidia may survive when blown by the wind is not known. The sporidia retain viability in damp air for relatively long periods of time, fair germination being obtained from sporidia which were exposed 26 hours in rather damp air, that is, with a relative humidity of over 70% and temperature of 58–62° F. Drying reduces viability, but alternate drying and wetting is not as deadly as formerly supposed; a fair percentage survived 4 and 5 redryings and a few as many as 11 dryings.—*L. C. Cash.*

1957. SPAULDING, P. Notes on other matters pertaining to the office of forest pathology. *Rept. Proc. Tenth Ann. Blister Rust Conf., Washington, D. C., Feb. 18–23, 1925.* [Mimeographed.] P. 74–76. 1925.—This is a brief description of the specimens, literature and slides relating to the white pine blister rust, exhibited at the conference.—*L. C. Cash.*

1958. THURSTON, H. W., JR., R. C. WALTON, AND F. N. FAGAN. Comparison of materials used in spraying and dusting for apple scab control in Pennsylvania. *Pennsylvania Agric. Exp. Sta. Bull.* 190. 1–20. Fig. 4. 1924.—As a result of 6 years' work in 26 orchards and at the Experiment Station, data are presented to show that lime-sulphur is still the standard fungicide for scab control. At least 1 application prior to the pink stage is said to be a necessity. The work includes many experiments with dust fungicides, several of which have given promising results. Other materials tested include dry lime-sulphur, precipitated sulphur, pyrox, sulphocide, B. T. S. paste lime-sulphur and New Jersey dry mix. Calcium arsenate included in lime-sulphur sprays did not increase their fungicidal value.—*H. W. Thurston, Jr.*

1959. WAITE, M. B. Apple cedar-rust control. *Rept. Proc. Tenth Ann. Blister Rust*

Conf. held in Washington, D. C., Feb. 18-23. 1925. [Mimeographed.] P. 29-34. 1925.—The paper outlines the life history of the apple cedar rust fungus, *Gymnosporangium juniperi-virginianae*. Methods of control are discussed and comparisons drawn between this disease and the white pine blister rust and other rust fungi.—*L. C. Cash*.

1960. WEIR, JAMES R. Notes on the parasitism of *Endothia gyrosa* (Schw.) Fr. *Phytopathology* 15: 489-491. *Fig. 1*. 1925.—During the summer of 1903, exposed roots of oak (*Quercus velutina*) and beech (*Fagus americana*) were inoculated with *Endothia gyrosa*. The roots were wounded, a wedge of wood infected with the fungus was inserted, and the wound then wrapped with waxed cloth. By the following spring the infection had spread and the fungus was fruiting 2-3 inches on either side of the wounds. On the beech roots the infection finally spread 5-6 inches on either side of the wounds. On oak the final spread was much greater. By 1911 the entire free upper surface of the roots had been invaded an average distance of 4 feet. The underground portions of the roots were not invaded. The results show this fungus to be a true wound parasite but of very slow development.—*B. B. Higgins*.

#### DISEASES CAUSED BY BACTERIA

1961. DRAYTON, F. L. Potato common scab investigations. Canada Dept. Agric. Exp. Farms, Div. Bot. Int. Rept. 1920-1921: 16-17. 1921.—Thirty-six different types of *Actinomyces* were isolated from soils and scabby tubers. The presence or absence of *Actinomyces* appeared to be dependent on the H-ion concentration of the soils examined.—*T. G. Major*.

1962. [ІАСНЕВСКИЙ, А. А.] Ячевский, А. А. Бактериальные болезни хлебных злаков. [Bacterial diseases of cereals.] (English summary.) Труды по Прикл. Бот. и Селекции. [Bull. Appl. Bot. & Plantbreed.] 14: 377-385. 1924-1925. [1925].—A diagnosis of the disease "black chaff" described by Erwin F. Smith is given. The author examined numerous wheat samples and on the basis of obtained data established localities of Russia where this disease is spread.—*M. Demerec*.

1963. LEVINE, MICHAEL. The so-called strands and secondary tumors in the crown gall disease. *Phytopathology* 15: 435-451. *Pl. 17-20*. 1925.—Inoculations with *Bacterium tumefaciens* were made by several methods on various species of plants, in an attempt to determine the nature of "tumor strands" and their relation to secondary tumors. It was found that neither strands nor secondary tumors developed when inoculations were made back of the region of elongation. When inoculations were made in the bud or very young tissues, strands were produced and secondary tumors sometimes developed above the point of inoculation, due, apparently, to infected tissue being carried upward by the elongation of meristematic tissue. These were, therefore, considered as integral portions of the original tumor at the point of inoculation. The so-called "tumor strands" in no case penetrated through mature tissues.—*B. B. Higgins*.

#### DISEASES CAUSED BY ANIMAL PARASITES (INSECTS, NEMAS, PROTOZOANS, ETC.)

1964. BAUDYŠ, E. O zelenušce žlutopásné na obilí. [Chlorops taeniopus on wheat.] Český odbor zem. rady moravské [Czech Sect. Moravian Dept. Agric. Circ.] 9. 1-4. 2 fig. 1924.—This is a popular description of the insect itself, of the damage which it does and of the method by which it can be controlled.—*M. Demerec*.

1965. FOLSOM, J. W. Entomology with special reference to its ecological aspects. 3rd ed. vii + 502 p. *Pl. 1-5, fig. 1-308*. P. Blakiston's Son & Co.: Philadelphia, 1922.—The 3rd edition has been brought up to date by the addition of a great deal of new material, including a few new illustrations. A new chapter on insect ecology is given, which should prove useful, as it is the only comprehensive treatment of ecology from the viewpoint of the entomologist. Subjects treated are classification, anatomy and physiology, development, adaptations of aquatic insects, color and coloration, insects in relation to plants, insects in relation to other animals, transmission of diseases by insects, interrelations of insects, insect behavior, distribution, insect ecology, insects in relation to man and a bibliography.—*L. C. Cash*.

1966. GUYTON, T. L., AND A. B. CHAMPLAIN. The oriental fruit moth. Pennsylvania Dept. Agric. Gen. Bull. 405. 1-7. *Pl. 1-4*. 1925. (Bull. Pennsylvania Dept. Agric. 89. 1925.)—No satisfactory control for the oriental fruit moth, *Laspeyresia molesta* Busek, is



known at present, although 40% nicotine sulphate used at the rate of 1-800 and added to the usual peach sprays gives partial control sufficient to warrant its use.—*H. W. Thurston, Jr.*

1967. LEACH, B. R. Control of Japanese beetle in lawns. Pennsylvania Dept. Agric. Gen. Bull. 410. 1-12. Fig. 6. 1925. (Bull. Pennsylvania Dept. Agric. 8<sup>4</sup>. 1925.)—Control is effected by treating infested lawns with emulsified carbon disulfide diluted with water. The cost of treatment is approximately twenty dollars for 7200 sq. feet.—*H. W. Thurston, Jr.*

1968. LOCHHEAD, W. Class book of economic entomology with special reference to the economic insects of the northern United States and Canada. xiv + 436 p. 257 fig. P. Blakiston's Son & Co.: Philadelphia, 1919.—The contents of this book are briefly as follows: The structure, growth and economics of insects; the identification of insects injurious to farm, garden and orchard crops, etc.; classification and description of common insects; and the control of injurious insects.—*L. C. Cash.*

1969. MARTIN, A. C. Ontogenetic study of the gall of *Phylloxera caryaeseptem*. Bot. Gaz. 79: 297-310. Pl. 22-25. 1925.—Two conical "up-walled" chambers, produced by one aphid, develop concurrently on opposite sides of the leaflet, and a partition consisting of modified leaf tissue is left as a septum between the compartments. Within the septum the tissues approximate a homogeneous condition, and remain as relatively inactive meristem, in which some hypertrophy is manifest, but in which only very little hyperplasia occurs. The septum is an evanescent structure, and in its deterioration the mesophyll cells attenuate horizontally and disappear, bringing the 2 epidermal layers into a temporary union. Eventually the epidermal layers break and the 2 gall cavities become 1. Growth tension appears to be the main factor in transforming the septum. In the region bordering on the septum, the meristem, differentiated from the original layers, expresses itself in prolific activity. Reversion to the primitive meristem condition is rapid, and is accompanied by extensive hyperplasia. Very pronounced hypertrophy ensues in most of the cells. In point of diversity this gall displays limited tissue differentiation. A nutritive zone, an extensive parenchymatous region containing vascular tissue and an epidermal layer covering certain parts of the surface of the gall are the chief tissues. Setal punctures are numerous within one gall. Sheaths are often associated with the punctures. Puncture channels are found frequently in tissues of active proliferation, as well as in regions of retarded growth. Greatly enlarged starch grains develop in some cells of the parenchyma.—*A. C. Martin.*

1970. MATZ, JULIUS. Root knot of sugar cane in Porto Rico. Phytopathology 15: 559-563. Fig. 1-2. 1925.—A root-knot disease of sugar cane, due to an undetermined species of *Heterodera*, has been found in widely separated areas in southern Porto Rico. The disease is indicated by a deep, waxy yellow coloration of the leaves, which begins at the tip and finally spreads to the leaf sheath. On young cane the older leaves become streaked longitudinally with red or copper colored areas separated by dead areas, and the whole plant becomes dwarfed and bunched in appearance. When such plants are pulled, swellings or knots are evident on the younger portions of the roots, about twice the diameter of the roots. Nematodes are found embedded in these swellings. In older swellings, impregnated females may be seen with the unaided eye. Thus far the disease has been found only in loose sandy soil in land with a sandy subsoil.—*B. B. Higgins.*

1971. PATCH, EDITH M. Potato aphids. Maine Agric. Exp. Sta. Bull. 323. 9-36. Fig. 2-6. 1925.—Aphids infesting the Solanaceae are important partly because of their transmission of potato degeneration diseases. The life history of *Macrosiphum solanifolii* Ashmead, *Myzus persicae* Sulzer, and *Aphis abbreviata* Patch are detailed, and control and its effects on disease transmission are discussed with special reference to roguing. A key, a list with synonymy, and a partial bibliography are given for the aphids of the Solanaceae.—*Donald Folsom.*

1972. STEINER, G. The problem of host selection and host specialization of certain plant-infesting nemas and its application in the study of nemic pests. Phytopathology 15: 499-534. Fig. 1-8. 1925.—The author, basing his conclusions partly upon the published data of other workers and partly upon his own studies, discusses the host relations of the plant-parasitic nemas, *Heterodera schachtii*, *H. radicola*, *F. dipsaci*, and *Tylenchus tritici*; host selection and specialization; the method and mechanism of finding the desired host; and the problems of host attraction, host indifference, host repellancy, host resistance, and host immunity. It

is shown that the nemie parasite prefers the same host species and variety on which its parents have fed. This preference increases in intensity with the number of successive generations developed on any host species or variety, until finally such a nema population will not attack other species or varieties except under conditions of starvation. This fact explains the many conflicting reports as to the immunity of certain plant species to attack by the parasites. This fact must also be taken into consideration in planning a rotation for infested soil. The length of time that a host plant has been grown on an infested field and the weed hosts present in the field, will affect materially the severity of the attack on the succeeding crop; and it is never safe to plant perennial crop plants in heavily infested soil unless such plant is known to be immune. As considered in the present paper the term "resistance" implies either mechanical or chemical barrier against the entrance of the parasite. Some plants reported as resistant were evidently merely non-attractive to the nema population of the soil in which they were grown. The nature of resistance in certain cow pea varieties has been determined. By comparing root structure of resistant and susceptible varieties, it was found that resistant varieties showed more complete suberization of the cortical cells, more even distribution of mechanical tissue, and starch bearing cells farther from the surface than in susceptible varieties. Immune plants are those attacked but not injured by the nemas. The injury produced by the parasites is not due to mechanical injury to the host cells by the spear but to some toxic substance, probably secretions of the salivary gland injected into the host cell. Apparently the nemas find the host plant by means of sensory organs, the amphids, which probably have the ability to differentiate chemical secretions from the young roots of plants carried to them in the soil water.—*B. B. Higgins.*

1973. TROUVELOT, B. *Recherches de biologie appliquée sur la teigne des pommes de terre et ses parasites et considérations générales sur l'utilisation des insectes entomophages en agriculture.* [Biological research applied to the potato-moth and its parasites and the problem of utilizing insect parasites in agriculture.] (Thesis.) 136 p. 32 fig. Paris Inst. Nation. Agron., 1923.—The article gives the distribution of the potato-moth, *Phthorimoea operculella*, in France, its economic importance, its control by agricultural practices, its limitation by entomophagous insects, a biological study of *Habrobracon Johannseni*, an important parasite of the potato-moth in North America, and general remarks on the acclimatization of foreign entomophagous insects.—*L. C. Cash.*

1974. VAN LEEUWEN, E. R. *Sprays for the Japanese beetle.* Pennsylvania Dept. Agric. Gen. Bull. 406. 1-8. Fig. 5. 1925. (Bull. Pennsylvania Dept. Agric. 8<sup>10</sup>. 1925).—Directions for applying the acid lead arsenate, flour and water spray are presented.—*H. W. Thurston, Jr.*

#### INFECTIOUS CHLOROSIS (MOSAIC AND PEACH YELLOWS GROUPS, ETC.)

1975. HOCKEY, J. F. *Mosaic and leaf curl of the cultivated raspberry.* Canada, Dept. Agric. Circ. N.S. 1. 1-4. 1923.—The symptoms and control of these diseases are discussed in a popular manner.—*T. G. Major.*

1976. HOCKEY, J. F. *Report of the Dominion Laboratory of Plant Pathology, St. Catharines, Ontario.* Canada, Dept. Agric. Exp. Farms, Div. Bot. Rept. 1922: 32-43. 1923.—Detailed instructions are given for the control of raspberry leaf curl and mosaic by roguing. Extension work included the establishment of a raspberry inspection service and the certification of disease-free raspberry stock.—Blue stem of black raspberry was found for the first time in the Niagara district.—A root-rot of canning peas caused a 14% loss in Prince Edward Co.—*T. G. Major.*

1977. MCKINNEY, H. H. *A mosaic on winter wheat and winter rye.* Phytopathology 15: 495-496. 1925.—This disease of wheat has recently been found to be a true transmissible mosaic, transmissible through expressed juice of the diseased plants. The causal agent persists from year to year in the soil. No evidence of seed transmission has been found. A similar mosaic on winter rye is also reported.—*B. B. Higgins.*

1978. MURPHY, PAUL A., AND ROBERT MCKAY. *Investigations on the leaf-roll and mosaic diseases of the potato.* Jour. Dept. Lands and Agric. [Ireland] 25: 138-154. 5 fig. 1925.—Sprouting vigor as indexed by Schander and Richter's method did not show a relationship to leafroll or mosaic, except to leafroll in a few lots. Other characteristics of



the sprouts also failed as indicators. Very early digging could be done before much infection of healthy plants had occurred. In a region where degeneration occurs rapidly in the absence of control measures, freedom from disease has been maintained by planting hills 10 yards apart among other crops. Tolerance to mosaic is more common than lack of susceptibility. Leafroll is transmitted by aphids (*Myzus persicae*, *M. pseudosolani*, and *Macrosiphum solani-folii*) infesting the sprouts, but with inconsistent results. Leafroll and mosaic are transmissible through the true seed.—*Donald Folsom*.

1979. PETHYBRIDGE, G. H. **Potato leaf-roll.** Jour. Ministry Agric. Great Britain 31: 863-869. 1924.—This is a popular account of the occurrence, symptoms, damage, transmission and control of leaf-roll of potatoes in Great Britain.—*M. B. McKay*.

1980. RANKIN, W. H. **Report of the Dominion Field Laboratory, St. Catharines, Ontario.** Canada, Dept. Agric. Exp. Farms, Div. Bot. Rept. 1921-1922: 30-60. 3 fig. 1922.—This is a rather full report of 2 years' work on the leaf curl and mosaic diseases of the cultivated red raspberry. The 2 diseases are discussed as to their economic importance, symptoms when occurring separately and together, varietal susceptibility, favoring soil and climatic conditions, etiology and control.—*T. G. Major*.

1981. WALKER, M. N. **Studies on the mosaic disease of *Nicotiana glutinosa*.** Phytopathology 15: 543-547. Pl. 24. 1925.—The heretofore reported occurrence of a mosaic of *Nicotiana glutinosa* distinct from the mosaic disease of tobacco (*N. tabacum* L.), led the author to make several series of cross inoculations. The mosaic disease from *N. glutinosa* was readily transferred by inserting bits of crushed diseased leaves into young plants of *N. tabacum*, and by the same method from *N. tabacum* to *N. glutinosa*. Plants of *N. glutinosa* inoculated during the winter usually failed to develop mosaic symptoms during the usually accepted incubation period, which may account for the reported immunity of this species to tobacco mosaic.—*B. B. Higgins*.

#### NON-PARASITIC DISEASES

1982. BARRUS, M. F. **An account of seed troubles in some parts of New York State during the past month.** Potato News Bull. 2: 315-316. 1925.—Observations are reported on poor stands in western New York due to seed piece decay apparently associated with high soil temperature subsequent to planting. A condition in the foliage simulating leafroll, but ascribed to weather, which was cool following hot, was observed in many fields.—*F. Weiss*.

1983. BIRD, MAURICE. **Soil hygiene in its relation to cane "disease."** Internat. Sugar Jour. 27: 423-424. 1925.—An excess of magnesia over lime, which exerts a toxic effect on sugar cane, is believed by the author to be responsible for an apparent epidemic that caused areas of cane on several estates in British Guiana to wither at the top, cease growing, and ultimately die after a fine growing season throughout the autumn. Soils from affected fields, soil sifted from and adhering to the roots of dead cane, and the ash of the juice from dead and live canes were analyzed and the results are given in 3 tables. The phosphoric acid was found to be low but frequently no dying of the cane is found where it is still lower, and as the sifted soil from the roots showed a large amount of plant food, starvation could not be the cause of the trouble. The analyses, however, showed an excess of magnesia over lime in the soil surrounding the roots of the dead cane and to a much greater extent in the ash of the cane. The soil of the affected areas was extremely impervious, being very stiff clay, and owing to the abnormally rapid growth of the cane there was a heavy demand for lime on the soil close to the roots, which demand could not be supplied without causing a toxic ratio of lime and magnesia. The fact that the succeeding crop was vigorous and healthy is explained on the principle that on the death of the cane the demand for lime ceased and the slow circulation of the soil water probably more or less completely restored the equilibrium between lime and magnesia. The author recommends the use of agencies that will render the soil more porous—that is, incorporation of vegetable matter—thorough tillage, and application of lime.—*Nellie E. Fealy*.

1984. GARNER, [W.]. **A new tobacco disease.** Better Crops 44: 17-18. 1924.—This is a brief note on sand drown, a physiological disease due to lack of magnesia in the soil.—*L. C. Cash*.

1985. KAY, ALBERT O. **Soil moisture studies in relation to diseased tree conditions in**

**Brevard County.** Citrus Indust. 6<sup>8</sup>: 5-9, 22-23. 6 fig. 1925.—Following the finding that citrus trees in the vicinity of Cocoa, Brevard County, Florida, were suffering from a deficiency of moisture at certain seasons of the year, whereas at other times there were indications that excessive water was also affecting the trees, the author began a study of the soil moisture conditions in the groves throughout the year and of the effectiveness of the rainfall in replenishing the soil moisture removed by evaporation and transpiration. There were found to be at least 8 different soil types and 11 phases prevailing in the areas planted to citrus, and trees apparently suffered from either extreme of moisture on all these types and phases. The wilting was most prevalent on the 2 predominating soil types, Norfolk sand and Gainesville sand, the latter being more or less closely underlain by coquina rock. Great variation was found in the moisture conditions of the soil, both horizontally and laterally, the transition from moist to dry soil often being quite abrupt. It was not unusual to find incoherent dry sand at any depth down to 5 feet, the limit of the sampling. Great difficulty was experienced in re-wetting the soil after it had dried out to the incoherent or "running dry" stage, and local pockets of dry soil were frequently found under trees after several inches of rainfall.—The author also discusses a similar wilting and decline of citrus trees whose roots have been injured by prolonged saturation of the soil, and cases of injury where extreme wetness was followed by extreme dryness. He attributes the high mortality of citrus trees in certain groves in the vicinity of Cocoa to these irregular soil moisture conditions. The physical characters of the different soils in favoring such irregular moisture conditions are discussed in considerable detail.—*Arthur S. Rhoads.*

1986. MEINECKE, E. P. An effect of drought in the forests of the Sierra Nevada. Phytopathology 15: 549-553. Fig. 1-2. 1925.—During September, 1924, a great many trees were observed to be dying in scattered groups in the Stanislaus National Forest. These groups were located on the rocky east-and-west ridges running out from the main backbone of the Sierra Nevada range. The tree associations were composed principally of *Pinus ponderosa*, *P. lambertiana*, *Abies concolor*, *Libocedrus decurrens*, *Pseudotsuga taxifolia*, and scattered trees of *Quercus californica*. All species except *Libocedrus decurrens* were affected. The trees died from the top downward and from the outside in. All the observed evidence indicates that these trees growing in rockbound pockets were killed by the unusual drought of 1924.—*B. B. Higgins.*

1987. RAMSEY, G. B. Fumigation injury of watermelons. Phytopathology 15: 479-481. Fig. 1. 1925.—It was found that formaldehyde fumigation of cars of watermelons, in compliance with requirements in the "Hoof and Mouth" disease quarantine in California, often caused serious blistering and pitting of the melons.—*B. B. Higgins.*

1988. RIKER, A. J., AND G. W. KEITT. Crowngall in relation to nursery stock. Science 52: 184-185. 1925.—The enlargements commonly found about the unions of apple root grafts have been generally attributed to the action of *Bacterium tumefaciens*. New experiments show that such enlargements may appear in grafts made under sterile conditions and that in 175 cases of nursery stock discarded on account of the malformations, standard technique failed to reveal the presence of these bacteria in any plant. It appears that the overgrowths are associated with imperfect unions and consequent disturbances in the conductive tissues.—*C. J. Lyon.*

1989. ROSSEELS, E. G. Usines à zinc—Degats à la vegetation. [The damage to vegetation caused by zinc factories.] Bull. Soc. Centrale Forest. Belgique 31: 202-214. 1924.—It was formerly believed that the powders of arsenic, lead, and zinc, emanating from zinc factories caused most of the damage to tree growth and other vegetation. Intensive research has shown, however, that the greater part of the damage is caused by sulphurous oxides in gaseous form. Two classes of damage are recognized, visible and invisible. Damage to 150 hectares of Scotch pine were observed following the installation of a zinc and lead roasting factory.—The action of the sulphur gas is described in detail under the following heads: (1) Action on vegetation; (2) action on the soil; and (3) factors modifying the noxious influence of sulphur oxides. Fir, spruce, Scotch pine, beach and hornbeam are listed as very sensitive species; birch, basswood and oak as sensitive; larch, chestnut, ash, alder and willow as resistant; and poplar as very resistant.—The author concludes that although



methods are available for recovering most of the sulphuric gases and converting them to sulphuric acid, there is always considerable leakage and consequent danger in the immediate vicinity of factories working sulphurous minerals. By proper methods of recovery and dilution it should be possible to confine the danger to within 1 km. of the factory.—*H. T. Gisborne.*

1990. SWINGLE, CHARLES F. Burr-knot of apple trees—its relation to crown gall and to vegetative propagation. *Jour. Heredity* 16: 312-320. 4 *Illus.* 1925.—The phenomenon is recorded of the occurrence of burr-knots of the stems of healthy, mature, vigorous, apple trees of commercial varieties. These burr-knots are actually young roots. Such burr-knots occur entirely as a varietal characteristic and are distinct from the "hairy root" form of crown gall (*Bacterium tumefaciens*). It is probable that many individual trees, and entire varieties as well, have been discarded because of the confusion of burr-knots with "hairy root." Of nearly 500 varieties observed, almost half showed some tendency towards burr-knots. Most of these varieties are little known commercially, although the list of varieties showing pronounced burr-knots includes Northern Spy, Esopus, Fameuse, Tompkins King, Early Harvest, Wagener, Rambo, Rome, and Wealthy. Burr-knots, when present, first appear as points pushing out the bark on branches 2-25 years old, depending upon the variety. In all plant layerage and stem cuttage, the process of rooting is either (1) a continuation of the growth of roots already differentiated, or (2) the actual differentiation from meristematic tissue of such roots, followed by the later development of these differentiated cells. The former process is by far the easier to bring about in propagation. These dormant roots in the burr-knots of apple varieties grow rapidly under layerage, and at least for some varieties, if planted as cuttings. It is suggested that the symptoms now known as crown gall may be due to any of the following causes: Burr-knots; uncongeniality; faulty manipulation of grafts; woolly aphid injury; actual infection with *Bacterium tumefaciens*.—*Author.*

#### DISEASES OF UNKNOWN CAUSE

1991. ELLIOTT, CHARLOTTE. Oat blast. *Phytopathology* 15: 564-567. 1924.—During each of the 3 years, 1922-1924, counts have been made of the number of blasted or undeveloped spikelets in 24 heads taken at random from plats of several varieties of winter oats grown at Arlington Farm, in order to determine the possible correlation of weather conditions at heading time and of varietal differences with the occurrence of "blast." Varietal differences in the amount of blast appear to be quite constant from year to year. While the amount of "blast" for all varieties was high in 1923, when rainfall was low at heading time, the results do not justify any definite conclusion as to the effect of weather conditions. The results indicated that the hybrid origin of certain oat varieties may account for the high percentage of sterile spikelets in the heads.—*B. B. Higgins.*

1992. SHAPOVALOV, MICHAEL. High evaporation: a precursor and a concomitant of western yellow tomato blight. *Phytopathology* 15: 470-478. *Fig. 1-6.* 1925.—A comparison of the recorded outbreaks of western yellow blight of tomatoes with climatological data for the months of May to September for that year shows a distinct correlation between severity of the disease and the evaporation rate for the region in which the disease occurred. Careful evaporation records and weekly counts of diseased plants at 2 stations during the summer of 1924 showed that a marked rise in evaporation rate preceded the first serious outbreak of the disease. Later, with a drop in the evaporation rate, many plants showed partial recovery. No attempt is made to explain the correlation.—*B. B. Higgins.*

#### GENERAL AND MISCELLANEOUS PATHOLOGICAL LITERATURE

1993. ANONYMOUS. Acetaldehyde as a fungicide. Canada Dept. Agric. Exp. Farms, Div. Bot. Int. Rept. 1920-1921: 18-20. 1921. The fungicidal and germicidal value of acetaldehyde is too low for commercial use.—*T. G. Major.*

1994. ANONYMOUS. Certification of potatoes. *Jour. Ministry Agric. Great Britain* 31: 376-379. 1924.

1995. ANONYMOUS. Rothamstead experimental station. Opening of the plant-pathology laboratories. *Nature* 116: 32. 1925.—This account includes some description of the plots.—*O. A. Stevens.*

1996. BERKELEY, G. H. Report of Dominion Field Laboratory of Plant Pathology, St. Catharines, Ont. Canada Dept. Agric. Exp. Farms, Div. Bot. Rept. 1923: 16-23. 1924.—Spraying for the control of aphids to prevent the spread of raspberry mosaic was not successful, there being an increase of 3.8% over the previous season. It appears that the amount of raspberry leaf curl in the Niagara district is on the decrease. Studies were initiated on the blue stem disease of raspberries and on root-rots of strawberries. Spraying experiments were conducted for the control of brown-rot blossom blight of cherry and peach leaf curl.—*T. G. Major*.

1997. BERKELEY, G. H. Tomato diseases. Canada Dept. Agric. Bull. n.s. 51. 1-14. Fig. 1-8. 1925.—The author discusses in brief such problems as choice of seed, sanitation, crop rotation, soil sterilization, spraying and dusting, staking and marketing in their relation to the production of a healthy crop. Short descriptions and measures of control are given for Septoria leaf-spot, blossom-end rot, target spot (*Alternaria solani* E. & M.), Phoma rot, Fusarium wilt, Verticillium wilt, bacterial wilt, sclerotial wilt, western yellow blight, damping-off, Cladosporium leaf mold, anthracnose, late blight, mosaic, streak, and sunscald.—*T. G. Major*.

1998. BORCHERT, A. Die seuchenhaften Krankheiten der Honigbiene. [Diseases of the honey-bee.] 76 p. 17 fig. Richard Schoetz: Berlin, 1924.—The publication gives the definition, symptoms, causes, distribution, transmission, diagnosis and methods of combatting various bacterial and fungous diseases of bees.—*L. C. Cash*.

1999. BROWN, J. G., AND FREDERICK GIBSON. A machine for treating cotton seed with sulphuric acid. Arizona Agric. Exp. Sta. Bull. 105. 381-391. Fig. 1-7. 1925.—For several years the authors have experimented with various reagents in the treatment of cotton seed for the purpose of preventing cotton diseases, especially angular leaf-spot. Among the reagents used were  $\text{CuSO}_4$ , concentrated  $\text{H}_2\text{SO}_4$ , formaldehyde, hot water,  $\text{HgCl}_2$ , and wood alcohol. All aqueous solutions failed because air bubbles entrapped in the lint prevented thorough wetting of the surface of the seed. Concentrated  $\text{H}_2\text{SO}_4$  gave perfect surface sterilization of the seed, a shorter period of germination, an increased percentage of germination, ease in handling the seed during planting operations, and a healthier and more uniform stand. However, the method of mixing the acid with the seed by hand, which was suggested by the Alabama Agric. Exp. Sta. in 1911, was found to be slow and dangerous. A machine was therefore designed and constructed for the purpose of applying the acid to the seed. This machine delints cotton seed quickly and cheaply, and makes the use of  $\text{H}_2\text{SO}_4$  comparatively safe for the operator. The bulletin describes the structure of the machine and the advantages and the cost of the sulphuric acid treatment.—*Authors' abstract*.

2000. CUNNINGHAM, G. C. Report of the Dominion Field Laboratory, Fredericton, N. B. Canada Dept. Agric. Exp. Farms, Div. Bot. Int. Rept. 1920-1921: 57-67. 1921.—The potato work included spraying demonstrations, distribution of high grade seed, roguing and selection, and investigations on the partial failure of the crop in certain sections of the province. Studies were also made on the control of the rot of turnip stecklings.—*T. G. Major*.

2001. CUNNINGHAM, G. C. Report of the Dominion Field Laboratory, Fredericton, N. B. Canada Dept. Agric. Exp. Farms, Div. Bot. Rept. 1921-1922: 23-30. 1 fig. 1922.—Investigational work was carried out on the clubroot of crucifers, Septoria leafspot of tomato, Sclerotinia stem rot of vegetables, and bean mosaic and anthracnose.—*T. G. Major*.

2002. DRAYTON, F. L. Survey of the prevalence of plant diseases in Canada 1922. Canada Dept. Agric. Exp. Farms, Ann. Rept. 3: 1-192. 1923.

2003. DYE, H. W., AND A. G. NEWHALL. The control of bacterial blight of celery by spraying and dusting. New York Agric. Exp. Sta. [Cornell] Bull. 429. 3-30. Fig. 1-10. 1924.—Bacterial blight (*Pseudomonas apii* Jagger) and late blight (*Septoria apii* Rostr.) are considered the chief diseases of celery. The early green varieties are resistant and the newer strains of Golden Self Blanching appear to be disease-escaping because of their rapid, vigorous growth. For the control of blight, 5-7 applications of spray or dust had been applied at 5-13 day intervals. The copper was effective, while the sulphur fungicides did not control the blight. The proprietary Bordeaux mixture was not as efficient as the home made or the copper-lime dust. Addition of resin-fish-oil sticker to the home-made Bordeaux did not give better blight control. The cost of 7 applications on an acre basis was 12, 14 and 20 dollars for the



home made 5-5-50 Bordeaux, the home mixed 20-80 copper-lime dust and the ready-mixed copper-lime dust, respectively. The 20-80 copper-lime dust can be applied in the seedbed as well as in the field.—Late blight was found to be difficult to control after the disease had become established and applications made at 4-5 day intervals were necessary when the plants were growing rapidly.—*W. O. Gloyer*.

2004. FRYER, J. C. F., AND G. H. PETHYBRIDGE. **The Phytopathological Service of England and Wales.** Jour. Ministry Agric. Great Britain 31: 331-340. 1924.—The article presents a résumé of the various phases of work carried out directly or indirectly by the government with the object of controlling the damage caused by plant pests and diseases in England and Wales.—The Phytopathological Service as now organized consists of 2 main sections: (A) The official section attached to and controlled directly by the Ministry of Agriculture. This is divided into 3 units: (1) The pathological laboratory at Harpenden, which has a small entomological and mycological staff; (2) an administrative unit, forming an integral part of the Horticulture Division of the Ministry in London; (3) the Ministry's inspectorate, about 30 members of which have special qualifications in regard to plant pests and diseases, although these officers are not exclusively employed on such matters.—(B) The non-official section distributed through the various Universities, Agricultural Colleges and Research Institutes of the country, financial provision for which comes from government funds, but which is free from the detailed instructions of the Ministry, and subject only to a certain amount of supervision to ensure efficiency. This consists of: (1) The Phytopathological Research Institute attached to the Rothamsted Experimental Station at Harpenden, and also scientific workers attached to such specialized research stations as the Long Ashton Fruit Station, Bristol, the Imperial College of Science, London, the Fruit Station at East Malling, the Lea Valley Station, Cheshunt, and the Department of Helminthology of the London School of Tropical Medicine; and (2) the Corps of Advisers, consisting of an entomologist and mycologist in each agricultural province, 14 in number.—The field of work covered by one part or another of the service includes the diagnosis of the cause of diseases, research on fundamentals, investigation and trial of probable practical measures of control and the rendering of the last-named available to the industry.—*M. B. McKay*.

2005. GASOW-MÜNSTER, H. **Das Eichensterben in Westfalen.** [The death of oaks in Westphalia.] Weiner Allg. Forst- u. Jagdzeitg. 43: 187-189. 1925.—The dying of oaks is believed to progress in 3 stages, the first a physiological weakening caused primarily by drouth, followed by a preliminary attack of parasites—mildew and buprestid beetles—with wood-destroying fungi as the final stage.—*F. S. Baker*.

2006. GÜSSOW, H. T. **Interim report of the Dominion Botanist.** Canada Dept. Agric. Exp. Farms, Div. Botany Rept. 1921-1922: 1-14. 1922.—The white blister rust work during 1921 included the inspection of control areas and wood lots, and scouting work in British Columbia. Studies have been undertaken on the Armillaria root-rot of conifers and other trees. Needle blight of white pine was again prevalent in the Timigami Forest Reserve.—Short reports are given of the potato inspection and certification and nitro-culture work.—*T. G. Major*.

2007. GÜSSOW, H. T. **Report of the Dominion Botanist.** Canada Dept. Agric. Exp. Farms, Div. Bot. Rept. 1922: 1-23. Fig. 1-4. 1923.—The year's work in economic botany is briefly outlined.—A survey of the white pine blister rust situation in Eastern Canada showed that the rust has not established itself to any extent in areas containing merchantable quantities of white pine. Owing to the small white pine area in British Columbia, Ribes eradication on a large scale does not appear to be economically feasible.—The death of a number of larch trees and of a white pine in Ottawa was found to be due to root asphyxiation.—The symptoms, etiology, and control of iris rhizome rot (*Bacillus carotovorus*) are briefly described.—The results of the Dominion Plant Disease Survey and of the Potato Inspection Service are summarized.—*T. G. Major*.

2008. GÜSSOW, H. T. **Seed potato certification.** Canada, Parliamentary Session 1924, Select Standing Committee on Agriculture and Colonization (Separate of address, 23 p. 1924).—The origin and development of the potato inspection service in Canada is described along with the present organization, scope of work, standards of certification, and practical results obtained.—*T. G. Major*.

2009. HOFFMAN, A. H., AND H. L. BELTON. Machines for coating seed wheat with copper carbonate dust. California Agric. Exp. Sta. Bull. 391. 1-16. 1925.—The requirements of a machine to dust seed wheat with copper carbonate consist in (1) complete coating of each kernel, (2) allowing little or none of the copper carbonate to escape into the air because it is irritating to the eyes and nasal linings and is poisonous, (3) sufficient capacity, and (4) in a machine that will clean itself completely. Various types of mixers are illustrated and described.—A. R. C. Haas.

2010. KÖCK, GUSTAV. Die volkswirtschaftliche Bedeutung der Pflanzenkrankheiten. [Economic importance of plant diseases.] Wiener Landw. Zeitg. 75: 285-286. 1925.—This is a comparison of the losses occasioned by plant diseases in the U. S. A., as reported in Supplement 36 of The Plant Disease Survey, 1924, with the losses as estimated in Austria, where no statistics of plant diseases exist. In certain crops the losses in Austria are materially greater, owing to failure to apply standard control measures.—F. Weiss.

2011. LARUE, CARL D. Loss of virulence in fungi. Science 62: 205-206. 1925.—A tentative theory is advanced to explain the relatively small number of proved cases of loss of virulence among parasitic fungi. Mutations are held to be responsible for the continued existence of the fungus during its growth as a saprophyte and when it is again grown as a parasite the saprophytic strains perish while only mutant parasitic strains cause an infection.—C. J. Lyon.

2012. MACCURRY, J. B. Report of the Dominion Field Laboratory, Charlottetown, P. E. I. Canada Dept. Agric. Exp. Farms, Div. Bot. Int. Rept. 1920-1921: 22-56. Illus. 1921.—Investigations on late blight of potatoes, 1915-1920, included experiments on spraying, trial of resistant varieties, effect of temperature, and methods of harvesting and storage. Black leg of potatoes was controlled by tuber treatment with corrosive sublimate or formalin and the selection of healthy seed. Wilt of the *Verticillium* type was found to be carried by seed. Various phases of the leaf roll, mosaic, curly dwarf, and common scab diseases of potatoes were investigated. It was found that shell mud gives satisfactory results in place of marl or ground limestone in the control of club-root of crucifers. Studies were carried out on the control of loose smut of wheat and barley, wheat scab, and on sulphur dusting for apple diseases.—T. G. Major.

2013. MACCURRY, J. B. Report of the Dominion Field Laboratory, Charlottetown, P. E. I. Canada Dept. Agric. Exp. Farms, Div. Bot. Rept. 1921-1922: 15-22. 1922.—The experimental work included spraying for late blight, control of common scab, seed transmission of black leg, and manner of dissemination of leaf roll of potatoes.—T. G. Major.

2014. MACCURRY, J. B. Report of the Dominion Field Laboratory of Plant Pathology, Charlottetown, P. E. I. Canada Dept. Agric. Exp. Farms, Div. Bot. Rept. 1922: 23-32. Fig. 5. 1923.—Investigations were carried out on the control of late blight of potatoes, varietal resistance to late blight, mature versus immature potato seed, soil treatments to control common scab (*Actinomyces scabies* (Thax.) Güssow), and on transmission and control of potato leaf roll and mosaic.—T. G. Major.

2015. McLARTY, H. R. Diseases of plums and their control. Canada Dept. Agric. Circ. 15. 1-7. 1923.—Black knot, brown rot, plum pocket, silver leaf, shot hole, collar rot and frost injury are described briefly, with recommendations for control.—T. G. Major.

2016. McLARTY, H. R. Report of the Dominion Field Laboratory, Summerland, B. C. Canada Dept. Agric. Exp. Farms, Div. Bot. Rept. 1921-1922: 73. 1922.—The main problems requiring attention are the physiological diseases, control of fire blight, powdery mildew, and collar rot.—T. G. Major.

2017. McLARTY, H. R. Report of the Dominion Field Laboratory of Plant Pathology, Summerland, B. C. Canada Dept. Agric. Exp. Farms, Div. Bot. Rept. 1922: 64-74. Fig. 7-10. 1923.—Preliminary reports are given of studies on fireblight (*B. amylovorus*), powdery mildew of apples (*Podosphaera leucotricha*) and Jonathon breakdown. A number of physiological disorders on apples, pears, apricots, plums, and cherries are briefly described. The occurrence is noted of western yellow blight of tomato, blossom-end rot of pepper and internal browning of potato.—T. G. Major.

2018. McLARTY, H. R. Report of Dominion Field Laboratory of Plant Pathology, Summerland, B. C. Canada Dept. Agric. Exp. Farms, Div. Bot. Rept. 1923: 28-37. Pl. 3-7. 1924.



The addition of a casein spreader was found to increase the efficiency of lime sulphur in controlling powdery mildew of apples. Progress is reported in experiments on the dissemination of fire blight bacteria in apparently healthy fruit and with pruning tools, on the value of certain cultural methods in the prevention of corky core in apples, and on collar rot of apples. Pacolin and carbolic acid were found to be of no use in the control of potato scab. A soil moisture survey of the Okanagan Valley, in the fall, showed a variation from 1.5% to 35-48%.—*T. G. Major*.

2019. MAJOR, T. G. Report on tobacco disease investigations. Canada Dept. Agric. Exp. Farms, Tobacco Div. Rept. 1923: 38-41. 1925.—In addition to a disease survey, experiments were carried out on certain phases of the Thielavia root-rot, mosaic, the so-called "rust" diseases, and on seed bed sanitation. Investigations were undertaken on the etiology of the ring-spot or curly dwarf disease and a dwarfing of seedlings. A case of early blossoming in Warne tobacco was found to be due to cold weather at the time of transplanting, combined with a lack of organic material in the plant bed soil.—*Author*.

2020. MEIER, F. C. Extension work in plant pathology. Rept. Proc. Tenth Ann. Blister Rust Conf. Washington, D. C., Feb. 18-23, 1925. [Mimeographed.] P. 64-66. 1925.

2021. MOORE, H. C. Some phases of potato disease control in Michigan. Potato News Bull. 2: 306-308. 1925.—The use of certified seed has been popularized by donating small seed lots to boys' and girls' potato clubs. Cooperation between growers and inspectors of seed for certification has permitted raising the standard of requirements and at the same time increased the yield. Only 2% of all diseases is now tolerated at the 2nd inspection, and growers must maintain seed plots which are rogued 5 times and thoroughly sprayed. Spraying with 4-4-50 Bordeaux mixture is preferred to dusting, for the control of late blight, early blight and leaf hoppers; and an experiment showing the superiority of spraying over dusting is cited.—*F. Weiss*.

2022. MURPHY, P. A. Investigation of potato diseases. Canada Dept. Agric. Bull. 2nd Ser. 44. 1-86. 1921.—This bulletin embodies the results of the author's extensive investigations on potato diseases, including late blight, black leg, leaf roll, mosaic, curly dwarf and related troubles.—*A. W. McCallum*.

2023. PARTRIDGE, GEO. Potato inspection service. Canada Dept. Agric. Exp. Farms, Div. Bot. Int. Rept. 1920-1921: 5-12. 1921.—An outline is given of the Dominion Potato Inspection Service.—*T. G. Major*.

2024. RANKIN, W. H. Report of the Dominion Field Laboratory, St. Catharines, Ontario. Canada Dept. Agric. Exp. Farms, Div. Bot. Int. Rept. 1920-1921: 67-93. 1 fig. 1921.—Comparative tests were made of spraying and dusting schedules for apples and for plums and cherries. Experiments showed that peach canker cannot be controlled by tree surgery. The mode of transmission and control of raspberry leaf curl or yellows were investigated without definite results, and a study was made of the seasonal history of brown rot of stone fruits. Preliminary experiments were conducted on the nature of susceptibility, using potato tubers and a number of strains of bacteria of the *Bacillus phytophthorus* type.—*T. G. Major*.

2025. RANKIN, W. H., AND W. P. FRASER. Survey of the prevalence of common plant diseases in the Dominion of Canada 1920. Canada Dept. Agric. Exp. Farms, Ann. Rept. 1: 1-55. 1921.

2026. RANKIN, W. H., AND W. P. FRASER. Survey of the prevalence of common plant diseases in the Dominion of Canada, 1921. Canada Dept. Agric. Exp. Farms, Ann. Rept. 2: 1-62. 1922.

2027. ROBINSON, R. H. Spreaders for spray materials, and the relation of surface tension of solutions to their spreading qualities. Jour. Agric. Res. 31: 71-81. 1925.—A laboratory study is reported of materials that may improve the spreading properties of liquid sprays. A correlation of the surface tension values of various substances with the degree of spreading observed on different leaf and fruit surfaces showed no definite proportional relation. Solutions with a low surface tension generally exhibited spreading properties. Among the materials studied, skim milk or dried milk, to which had been added a small amount of hydrated lime, appeared to be the best spreader for practical purposes. The amount of lead arsenate that adhered to the leaf surface was approximately the same when a spreader was added as when one was not.—*Author*.

2028. SHEAR, C. L. Outline of work of office of Plant Disease Survey and Pathological Collections. Rept. Proc. Tenth Ann. Blister Rust Conf. Washington, D. C., Feb. 18-23, 1925.—[Mimeographed.] P. 62-63. 1925.—“The activities of this office are devoted to the gathering and supplying of as full information as possible concerning the occurrence and distribution of plant diseases and parasitic fungi and to rendering all assistance possible to pathologists, horticulturalists and investigators interested in plant pathology and plant culture.”—*Author*.

## PHARMACEUTICAL BOTANY AND PHARMACOGNOSY

HEBER W. YOUNGKEN, *Editor*

E. N. GATHERCOAL, *Assistant Editor*

(See also in this issue Entries 1332, 1374, 1439, 1443, 1541, 1591, 1760, 1761, 1804, 1876, 2075, 2080, 2137)

2029. ANONYMOUS. *Lathyrism*. Nature 116: 260-261. 1925.—This is a review of an article by ANDERSON, HOWARD AND SIMONSEN (Indian Jour. Med. Res. 12: 613. 1925.), reporting on poisoning from *Vicia sativa* seed due to admixture of the variety *angustifolia*.—*O. A. Stevens*.

2030. ANONYMOUS. *Digitalis in medicine*. [Rev. of: CUSHNY, ARTHUR R. The action and uses in medicine of Digitalis and its allies. xi + 103 p. Longmans, Green & Co.: London, 1925.] Nature 116: 8-9. 1925.

2031. BERNTON, HARRY S. On occupational sensitization to the castor bean. Amer. Jour. Med. Sci. 165: 196-202. 1923.—The author discusses a case of acquired sensitiveness to the dust of the castor bean. Manifestations of the sensitiveness are attacks of sneezing and asthma. The fat-free meal of the bean produces a wheal at the site of a scratch on the forearm. A drop of the protein solution of the meal in a dilution of 1:250,000 produces a cutaneous reaction, while application of the concentrated solution brings on symptoms of protein poisoning. Evidence points to the globulin fraction as the primary cause of the local reaction.—*David McC. De Forest*.

2032. HEATHCOTE, REGINALD ST. A. The action of camphor, menthol and thymol on the circulation. Jour. Pharm. and Exp. Therap. 21: 177-190. Fig. 1-7. 1923.—Camphor, menthol and thymol act as depressants on the isolated heart of the frog and the rabbit. All 3 dilate the coronary vessels. There is no convincing evidence that camphor possesses any value as a stimulant.—*David McC. De Forest*.

2033. HENDERSON, V. E. On the sensitivity of different nerve endings to atropine. Jour. Pharm. and Exp. Therap. 21: 99-102. 1923.

2034. LEECHMAN, ALLEYNE. The Amani Research Institute. Nature 116: 47. 1925.—This is a note on the possibilities of cinchona cultivation. Reference is made to a hybrid (*C. Ledgeriana* × *C. succirubra*) which has given promise of exceptionally good yields.—*O. A. Stevens*.

2035. LEWIS, THOMAS. The action of digitalis in cases of auricular fibrillation and flutter. Amer. Jour. Med. Sci. 164: 157-172. Fig. 1-5. 1922.

2036. RUDOLF, ROBERT DAWSON, AND F. M. R. BULMER. Some cardiac effects of atropin. Amer. Jour. Med. Sci. 168: 641-647. Fig. 1-6. 1924.

2037. SUGATA, H., AND A. L. TATUM. The effect of quinine intoxication on the respiratory center of the rabbit. Jour. Pharm. and Exp. Therap. 21: 293-299. 1923.—The principal effect of toxic doses of quinine is a rise of alkaline reserve capacity, owing largely to an increase in rate of respiration at the expense of depth and a consequent decrease in pulmonary ventilation.—*David McC. De Forest*.

2038. TEIXEIRA DA FONSECA, EURICO. Oleos vegetaes Brasileiros. [Vegetable oils of Brazil.] 180 p. Typ. Revista dos Tribunaes: Rio de Janeiro, 1922.

2039. YOUNGKEN, HEBER. W. The anatomy and botanical position of *Miré*. Jour. Amer. Pharm. Assoc. 14: 195-200. 7 fig. 1925.—The author describes the detailed structure of the rhizomes, roots, aerial stems and leaves of a new drug plant, called *Miré*, parts of which were collected by Rusby and White in Central Bolivia during the recent Mulford biological ex-



ploration of the Amazon Basin. After a gross and microscopic comparison of the stems and leaves of the Miré material with the same parts of herbarium specimens of *Brunfelsia hydrangæformis* collected by Miguel Bang at Uchimachi, Coroico, Bolivia in 1894 and by Weddell, in Brazil, in 1847, he concludes that all three sets exhibit a striking similarity in structure. Rusby has accepted the author's determination of the botanical origin of Miré as *Brunfelsia hydrangæformis* (Pohl) Benth after a later comparison of it with a series of specimens collected by himself and others.—*Author*.

## PHYSIOLOGY

B. M. DUGGAR, *Editor*

W. J. ROBBINS, *Assistant Editor*

(See also in this issue Entries 1370, 1382, 1404, 1434, 1456, 1548, 1587, 1610, 1684, 1702, 1774, 1788, 1791, 1807, 1808, 1809, 1811, 1847, 1874, 1878, 1989)

## GENERAL

2040. FINDLAY, ALEXANDER. The twilight zone of matter. *Science* 62: 192-197. 1925.—In this concise paper on the chemistry of colloids are included many statements of the physiological action of colloids and colloidal systems. Among the topics touched upon are protoplasm, antagonism, permeability, and cell membranes as they are related to colloids.—*C. J. Lyon*.

2041. KUSTER, ERNST. Botanische Betrachtungen über experimentelle Zellphysiologie. [Observations bearing upon cell physiology.] *Japan.-Deutsche Zeitsch. Wiss. u. Technik* 2: 109-114. 1924.—For a study of cell physiology many plant cells are to be recommended because of size, such as the siphonaceous algae *Caulerpa*, *Bryopsis*, *Valonia*, *Derbesia*, *Vaucheria*; likewise certain algal fungi, although the latter offer many difficulties arising chiefly from the fact that each plant cell ordinarily possesses a solid cellulose wall. The methods of experimental cell physiology are those of plasmolysis, of centrifugation, mechanical crushing, and treatment with poisons. The paper concludes with a statement of some of the results obtained and mentions a few of the future problems of experimental cell physiology.—*S. Ikeno (translated)*. (*Courtesy Japanese Jour. Bot.*)

2042. NICOLAS, G. Revue des travaux de physiologie végétale parus de 1910 à 1919. [Review of the work in plant physiology, 1910-1919.] *Rev. Gén. Bot.* 36: 499-511, 531-553. 1924.

## PERMEABILITY, PHYSICO-CHEMICAL RELATIONS

2043. ANONYMOUS. The nature of the cell membrane. *Nature* 116: 150-151. 1925.—Reference is made especially to a recent review of the subject by L. Lapicque.—*O. A. Stevens*.

2044. CSAPÓ, J. Einfluss der Neutralsalze auf die Säurebindung der Gelatine. [The effect of neutral salts on the combination of gelatin with acids.] *Biochem. Zeitschr.* 159: 53-57. 1925.—The chloride, nitrate, and iodide of sodium increased the combination of gelatin with HCl, HNO<sub>3</sub>, and H<sub>2</sub>SO<sub>4</sub>. Sodium sulphate decreased the amount combined, which was less in 0.02-0.03 N. H<sub>2</sub>SO<sub>4</sub> than in HCl of the same concentration. Acid combination was increased by cations in the order K < Na < Ba < Ca.—*H. D. Hooker*.

2045. EARLENBAUGH, LAWRENCE. The viscosity of flour and wheat. *National Miller* 30<sup>11</sup>: 22-23, 76-77. 1 fig. 1925.—During recent years cereal chemists have studied viscosity of wheat and flour to develop a method for determining their quality. The equipment and methods used by several investigators, including Sharp and Gortner, are described. Some original data from several grades of flour are presented to show that the quality factor discussed is a true measure of quality. The successful use of the viscosity test in commercial milling is shown. The writer concludes, however, that "viscosity will never prove to be the one test to be applied to wheat and flour, which is being hoped for by so many millers and managers." The following equation is advanced for a quality constant of wheat and flour:

$$\frac{\text{Viscosity} \times \text{Test Weight}}{\text{Percentage of Protein}} = \text{a Constant.} \text{—} J. \text{ Allen Clark.}$$

2046. FUJITA, A. *Untersuchungen über elektrische Erscheinungen und die Ionendurchlässigkeit von Membranen. III.* [Electrical phenomena and permeability of membranes.] *Biochem. Zeitschr.* 159: 370-378. 1925.—The potential difference between electrolyte solutions of different concentrations was not the same when the solutions were separated by a parchment membrane as when they were in free contact. The membrane acted as though it reduced the relative mobility of the anions. The membrane effect decreased with increased valence of the cation, being greatest for monovalent ions except for hydrogen which had no effect, and increased with increasing valence of the anion.—*H. D. Hooker.*

2047. LESAGE, PIERRE. *Emploi de l'Acétocellulose comme membrane osmotique.* [Use of acetocellulose as osmotic membrane.] *Bull. Soc. Sci. et Med. Ouest.* 29<sup>3</sup>: (1-5). 1920.—While studying the effects of different solutions on slips of various plants, the author tried to protect the cut ends by means of acetocellulose. In order to determine its value he constructed an osmometer of the Dutrochet type using as membrane a piece of cloth impregnated with this material. He found that satisfactory osmosis occurred with solutions of NaCl, sugar and alcohol. This was followed, after a time in each case, by a drop in osmotic pressure and by diffusion of the solute. He concludes that such a membrane is permeable to water, NaCl, sugar, and alcohol.—*H. V. Hendricks.*

2048. LESAGE, PIERRE. *Reprise de la vie active apres sejour dans les solutions alcooliques.* [Recovery of active life after immersion in alcoholic solutions.] *Bull. Soc. Sci. et Med. Ouest* 27<sup>1</sup>: 1-4. 1918.—The following explanation is suggested for the effect of alcoholic solutions on the viability of seed of *Lepidium sativum* as determined by the author's previous work. In weak solutions the more concentrated the alcohol the more rapidly it penetrates and kills the embryo but in stronger solutions the alcohol also acts upon the integument and renders it less permeable. Since it was not practicable to attempt the removal of the embryo from the seed, they were first allowed to germinate for 1-3 days, after which the time required for alcoholic solution of various strengths to prevent further growth after removal from the solutions was determined. It was found that with increasing dilutions of alcohol the time required gradually increased from less than 5 minutes for 94% to over 35 hours for 3% alcohol.—*H. V. Hendricks.*

2049. LESAGE, PIERRE. *Utilisation de la courbe des limites de la germination des graines après séjour dans les solutions.* [Utilization of the curve of limits in the germination of seed after immersion in solutions.] *Compt. Rend. Acad. Sci. Paris* 167: 1079-1082. 1918.—Seed of *Lepidium sativum* were placed in alcohols of different strengths and some from each concentration were withdrawn after various periods of time and their germinating powers tested. The times required to prevent germination were plotted as ordinates against the corresponding dilutions as abscissae and the resulting curve shows 3 critical points. The 1st, A, was for absolute alcohol and a period of 4 years; and 2nd, B, for 31.5% alcohol and 3 hours, was the concentration requiring the least time; while the 3rd, C, was for 2.35% and 40 days. With higher dilutions the seed were not only unaffected but actually germinated while in the solutions. Using lucern and clover, similar curves were obtained but with very different numerical values. Certain salt solutions were found to show similar effects. The author suggests that if such data could be collected for a number of species with solutions of NaCl, the selective action of various concentrations might afford a practical method of freeing a certain seed from undesirable kinds which cannot be readily removed otherwise.—*H. V. Hendricks.*

2050. MECKLENBURG, WERNER. *Influence of the water content of active carbons on their decolorizing power.* *Internat. Sugar Jour.* 27: 368-370. 1925.—Commercial decolorizing carbons contain a greater or less amount of water, which is present as "original water," "added water," or a mixture of both. A peculiar phenomenon possessed by certain active carbons is their imperfect stability on drying, that is, decrease of the decolorizing power of the carbon-containing original water as dryness increases. Carbons which do not resist drying can be prepared from the waste char dust of sugar refineries by igniting it in the absence of air and extracting with hydrochloric acid, the carbon left being washed with water until free from traces of the acid. Carbon thus obtained contains 80-90% original water and 10-25% ash, and in this state is well suited for decolorizing wine, removing as it does the red



and leaving a fine yellow color. If dried, the carbon loses this property, at least to a large extent. Laboratory investigations which throw further light on this phenomenon are described. The author's conclusion is that, since the decolorizing effect of the dry substance of a carbon-containing water in many cases depends on the water content, the carbon may not be dried before testing its efficiency.—*Nellie E. Fealy*.

2051. MINAKAMI, R. Über Ionen-Antagonismus. [Antagonism.] *Biochem. Zeitschr.* 158: 306-318. 13 fig. 1925.—Monovalent cations induced a relatively coarse-grained condition in soap solution as determined by surface tension measurements. The antagonistic action of bivalent ions was shown by a change to a finer grained state.—*H. D. Hooker*.

2052. MOORE, B. [Rev. of: KORSTIAN, C. F. Density of cell sap in relation to environmental conditions in the Wasatch Mountains of Utah. *Jour. Agric. Res.* 28: 845-908. 1924 (see Bot. Absts. 14, Entry 6618).] *Ecology* 6: 316-318. 1925.—There is given an epitome of the article reviewed, contrasting the results with those of C. G. Bates, J. A. Harris, and others, noting where there is agreement, contradiction, or new material.—*T. J. Fitzpatrick*.

2053. RUDOLFS, WILLEM. Effect of seeds upon hydrogen-ion concentration equilibrium in solution. *Jour. Agric. Res.* 30: 1021-1026. 1 fig. 1925.—Seed were immersed in representative salt solutions and in mineral and organic acids. The changes in H-ion concentration were recorded, these showing that different seed are able to change the H-ion concentration of the solutions to definite values, and that equilibrium is reached in all solutions after the seed have been immersed sufficiently long. The changes of the solutions in which previously soaked seed were immersed are very similar to the changes in solutions caused by air-dry seed.—The reaction changes caused by dried seed (dried at 100°-102°C. for 48 and 96 hours) are similar to those caused by fresh seed. The cotyledons of soy beans were more powerful to absorb ions from the solutions than were the seed coats; and the reaction changes caused by seed coats of corn were similar to those brought about by the whole seed, while changes caused by the endosperm of the seed (carbohydrates mainly) were negligible. The chemical properties of the chief protein constituent of the seed seem responsible for the changes in H-ion concentrations of solutions. (See also Bot. Absts. 12, Entry 3483.)—*Author*.

2054. SCHÄFER, A. Die Aufnahmefähigkeit von Lipoidgemischen. [The solvent capacity of lipid mixtures.] *Biochem. Zeitschr.* 159: 250-256. 2 fig. 1925.—The capacity of ether to dissolve iron was greatly reduced by the presence of benzol or oil.—*H. D. Hooker*.

#### WATER RELATIONS

2055. KASTENS, EMMA. Beiträge zur Kenntnis der Funktion der Siebröhren. [The function of the sieve tubes.] (Dissertation Hamburg. Universität.) *Mitteil. Inst. Allg. Bot. Hamburg* 6: 33-70. 5 fig. 1924.—Among species of Solanaceae (*Solanum*, *Capsicum*, *Datura*, *Nicotiana*, *Physalis*, *Petunia*) there occur at the nodes connections between the bark phloem and the pith phloem. Solanaceae that have been ringed are able to strengthen pith phloem and to form vascular wound tissue in the pith portion. These phenomena occur when the ring is made too deep into the tissue or when young stems are ringed. The behavior of completely ringed plants, possessing a constant pith portion shows that even a partial exposure of the sieve tubes signifies an injury to the plant. On the basis of their ringing experiments, the author assumes the sieve tubes to be the conducting paths of the hormones inducing cell division (in the sense of Haberlandt), these hormones having originated in the growing plants. Along with the cell division hormones there occur apparently in the sieve tubes also metabolism hormones. From the behavior of plants affected with mosaic and leaf roll, the present status of our knowledge does not assist us in drawing conclusions concerning the function of the sieve tubes. If there really exists the general assumption that organic food materials in large quantity pass through the sieve tubes, one must at least conclude from the preceding discussion that the view generally held is of doubtful value.—*M. Christiansen* (translated).

2056. YASUDA, SADAŌ. Relation between the amount of transpiration and the development of the vascular system in the rice plant. (Japanese.) *Bulteno Sci. Facultato Terkultura, Kjušu Imp. Univ.* 1: 1-18. 1924.—This study was undertaken to determine the rela-

tion between the amount of transpiration and the development of the vascular system of *Oryza sativa*. As the index of the latter, the cross sectional area of the vascular portion and the number of the vascular bundles at the basal part of the leaf blade were taken, and the former was measured by means of the weighing method, usually the leaf only being used.—The relation  $T/G$ , where  $T$  denotes the amount of transpiration per unit leaf area and time, and  $G$  the ratio of the cross section area of the vascular portion to the leaf area, has been studied on some strains. It was found that the quotient  $T/G = k$  is essentially constant in every case in one and the same strain cultivated under identical conditions. It is of course variable under different conditions, either external or internal; for instance, different methods of cultivation, different strains. So far as the author's studies go, the most important internal factors concerned here seem to be the structure, the number and the function of the stomata and the nature of the external wall of the epidermal cells.—*Author (Courtesy Japanese Jour. Bot.)*

### MINERAL NUTRIENTS, SALT RELATIONS

2057. DUSTMAN, ROBT. B. Inherent factors related to absorption of mineral elements by plants. *Bot. Gaz.* 79: 233-264. *Fig. 1-8.* 1925.—With regard to the influence of a varying calcium supply upon the acidity of expressed sap of tomato plants, it was found that lowering the calcium supply did not increase the H-ion concentration. Regardless of the change of direction of the calcium supply, the sap became somewhat less acid. A decreasing acidity gradient was found to be correlated with increasing age of tissues. Studies of  $CO_2$  output by roots lead to the conclusions, that  $CO_2$  is an important factor in aiding certain plants to secure essential elements from the soil, that  $CO_2$  production judged from the standpoint of either dry matter of roots or area of roots is greater in buckwheat and rye than in barley and corn, and that these facts may be correlated with observational data as to the ability of certain plants to grow satisfactorily on infertile soils. A satisfactory description of all methods used is given.—*B. W. Wells.*

2058. LESAGE, PIERRE. Action spéciale sur les plantes cultivées du chlorure de sodium contenu dans la sylvinite. [Special action on cultivated plants of sodium chloride contained in sylvinite.] *Ann. Sci. Agron. Française et Etrangere* 41: 109-121. 1924.—Barley and garden cress were grown in both water cultures and in the open garden with NaCl, KCl, mixtures of these salts, and with sylvinite (which contains 35% KCl and 50% NaCl). None of the solutions used were complete nutrient solutions. The results are not conclusive; some indication is given that sodium is effective in increasing growth, and that sylvinite is beneficial through its sodium constituent.—*J. B. Rhine.*

2059. SAKAMURA, TETSU. Action of electrolytes on the life activities of *Gonium pectorale* and *Pandorina Morum*. (Japanese.) *Bot. Mag. Tôkyô* 38: (79)-(93). 1924.—In cane-sugar solutions of differing osmotic pressure the motility and phototactic irritability of *Gonium* and *Pandorina* are strongly influenced. In cane-sugar solutions of over 0.2 molar concentration the motility is retarded and the sensitiveness to light arrested. The 16 cells of which the colony of *Gonium* is composed separate sooner or later in certain chloride solutions containing alkali or alkaline earth cations (including  $MgCl_2$ ), with the exception of  $CaCl_2$ . This specific action of single salts on the coherence of cells is arrested through the addition of  $CaCl_2$ ; here there is to be noted an antagonism between the Ca-ions and other alkali and alkaline earth cations.—The individual cells in a *Gonium* colony are surrounded by a rather thick gelatinous envelope which probably consists of pectin or related substances. The separation of the individual cells mentioned may well be attributed to the circumstance that the gelatinous envelope in a solution of single salts of alkalies or alkaline earths is changed into the soluble state or becomes greatly swollen, following which the coherence of the cells is broken. As is well known, pectin and the Ca salts of pectic acid are the important water-soluble binding elements in the cell walls of the higher plants. In *Gonium* this role of Ca may also be recognized as important from the standpoint of colony formation.—In relation to the movement of *Gonium* and *Pandorina* an injurious action is attributed to salts of alkalies or alkaline earths used singly. Ca is always favorable without exerting a very extreme action; indeed it acts as an antagonistic factor toward other cations. In higher concentra-



tions, Sr is a more favorable influence than Ca, only in the case of *Pandorina*. The succession of cation action in relation to movement is different depending upon concentration.—*Author (Courtesy Japanese Jour. Bot.)*.

### METABOLISM (GENERAL)

2060. ANONYMOUS. Baltimore meeting of the Sugar Section of the American Chemical Society. Internat. Sugar Jour. 27: 261-262. 1925.—Abstracts are given of the following papers read at the meeting: Physical examination of sugar juices, by K. L. LINDFORS; Testing apparatus and method for determining the filterability of raw sugars, by LOUIS E. DAWSON; Colour standards for soft sugars, by H. I. KNOWLES; Temperature and analytical changes in sugar liquor during boneblack filtration, by H. I. KNOWLES; Invertase hydrolysis constants for sucrose and raffinose, by H. S. PAINE AND R. T. BALCH; The relation of structure to rotatory power in the sugar group, by C. S. HUDSON; and Fermentation in the syrup phase of certain types of confectionery and means of controlling same, by H. S. PAINE AND J. HAMILTON.—*Nellie E. Fealy*.

2061. BLASCHKO, H. Über die Verbrennungswärme der Brenztraubensäure und ihre physiologische Bedeutung. [The heat of combustion of pyruvic acid and its physiological significance.] Biochem. Zeitschr. 158: 428-434. 1925.—The heat of combustion of dissolved pyruvic acid was 279,140 cal. (calories) per mol, the heat of solution 4560 cal. and the heat of neutralization 11,400 cal. As the heat of combustion of acetaldehyde is 279,300 cal. and the heat of solution 4480 cal. the decarboxylation of pyruvic acid liberates no heat. The heat of neutralization of pyruvic acid and carbonic acid are nearly the same, the latter being 11,200 cal.—*H. D. Hooker*.

2062. BUTKEWITSCH, W. Über die Chinasäure verwertenden Pilze und Bakterien. [Fungi and bacteria that utilize quinic acid.] Biochem. Zeitschr. 159: 395-413. 1 fig. 1925.—*Aspergillus niger*, *A. oryzae*, *Citromyces glaber* and *Penicillium glaucum* grew on quinic acid, pyrocatechol, hydroquinone, resorcinol and pyrogallol. Quinic acid was changed to phenols and sugar was converted to gluconic and citric acids. Yeast and *Mucor racemosus* did not utilize quinic acid nor convert it to phenols. The utilization of phenols depended on the number of hydroxyl groups and their arrangement. Pyrocatechol was most toxic in high concentrations and served as the best source of carbon at low concentrations. *Aspergillus niger* grew equally well in equimolecular solutions of pyrocatechol, quinic acid and glucose. Carbohydrate is probably not an intermediate step in the utilization of quinic acid by fungi. Certain bacteria likewise utilized quinic acid, converted it to phenols and produced gluconic acid from glucose, storing it as the calcium salt. The oxidative processes converting quinic acid to phenols and glucose to gluconic or citric acid are thought to be similar.—*H. D. Hooker*.

2063. COPEMAN, P. R. v. D. R. An investigation into some physical and chemical changes occurring in grapes during ripening. Union South Africa Dept. Agric. Sci. Bull. 30. 1-38. 30 fig. 1924.—Four varieties of table grapes, Red Hanepoot, White Hanepoot, Barbarossa, and Flaming Tokai, were studied in an attempt to find a more exact definition in physical and chemical terms of ripeness. Samples were collected from each variety weekly from January 31 to March 28. It was considered that the period of ripening began about February 20 and that the grapes were ripe on March 7. Determinations were made of average weight, volume and total solids of berries, volume of juice from 100 berries, specific gravity and Balling scale reading of juice, pH of juice (by the colorimetric method), titratable acidity, reducing and non-reducing sugars, and total content of substances reducing  $\text{KMnO}_4$  at boiling temperature. Average weight, volume and total solids of berry, volume and specific gravity of juice increased steadily through the ripening period, then decreased slightly and irregularly as the fruit became over-ripe. The Balling scale readings, dextrose and sucrose content, pH of juice, and quantity of  $\text{KMnO}_4$  required to titrate all reducing substances in the boiling juice, increased rather irregularly throughout the whole period. There was a rapid decrease in titratable acidity prior to the beginning of ripening, followed by a slower decrease which continued through the period of sampling. The increases in dextrose, Balling scale readings, and total reducing substances after ripeness is attained are regarded as

due to concentration of the solids of the berries after translocation into them has ceased, as they are accounted for by the decrease in volume and weight of berries. Sucrose was present in all the varieties at all times after February 7, increased slowly until the fruit became ripe, then more than doubled in amount in the 3 following weeks, reaching 2.15% in Red Hanepoot and approximating 1.5% in the others. This would appear to be the 1st report of the presence of sucrose in ripe grapes of *Vitis vinifera* varieties, which European authorities have regarded as being free of sucrose. At full ripeness the various constituents of the berry reach a condition of equilibrium such that for any given variety, the degree Balling multiplied by average weight and divided by 100, the dextrose content multiplied by average weight and divided by 100, the dextrose content divided by total solids, and the acidity multiplied by 10 and divided by dextrose content, yield factors which remain constant for several weeks.—*Joseph S. Caldwell.*

2064. FARNELL, R. G. W. **Investigation of the colloids of cane juices and syrups in Natal and Mauritius.** Internat. Sugar Jour. 27: 254-260. 1925.—Soil and climatic conditions of Natal and Mauritius with reference to their suitability for sugar-cane growing are briefly compared. Those of Mauritius, although varying in different localities, are better adapted to cane, the rainfall being much higher than in Natal. More than 99% of Natal's cane is the Uba, while in Mauritius practically none of this variety is grown. The great hardness of Uba seems to be partly due to its high colloid content. The colloids bind water and increase its resistance to drought and disease. Because of its slow growth in Natal, where it takes 2 years to mature, its sucrose content is generally high and its purity very fair, but its glucose content is low, with ash and colloid content high. A brief comparative description of Natal and Mauritian methods of making white sugar is given. In experiments with various juices and molasses taken from various factories in the 2 countries the author determined the total colloid, total "pentosan," colloidal pentosan, total nitrogen, colloidal nitrogen, wax, total ash, and colloidal ash. The results are given in 8 tables, with analytical data.—*Nellie E. Fealy.*

2065. FELLERS, CARL R., AND RAY W. CLOUGH. **Indol and skatol determination in bacterial cultures.** Jour. Bact. 10: 105-133. 1925.—A critical review of the literature on indol and skatol tests is given. The various methods are compared and the Ehrlich method for indol and a diethylanalin test for skatol is recommended. *Clostridium skatol* n. sp. was mentioned but not described.—*C. E. Skinner.*

2066. FRED, E. B., W. H. PETERSON, AND W. R. CARROLL. **The occurrence of a red pigment producing organism in corn mash of the acetone and butyl alcohol fermentation.** Jour. Bact. 10: 97-104. 1925.—In the biological production of acetone and alcohols by *Bacillus granulobacter*, the formation of a red or pink coloration on the surface of the corn mash is common. The color is due to a very resistant spore-forming organism, *B. globigii* Migula (*B. mesentericus-ruber* L. and N.). Ethyl alcohol and acetone were produced from xylose and from glucose by this organism. When grown in association with *B. granulobacter*, *B. globigii* did not reduce the amount of solvent materials produced from a given amount of mash under that produced by *B. granulobacter* alone.—*C. E. Skinner.*

2067. FRED, E. B., W. H. PETERSON, AND H. R. STILES. **The biochemistry of the granulated lactic acid bacteria from cereals.** Jour. Bact. 10: 63-78. 4 fig. 1925.—The granulated, high-acid forming bacteria of cereal infusions have been isolated and their cultural characters described. These organisms are closely related to the high-acid forming bacteria known as *Lactobacillus Delbrücki*. Their cultural characteristics and fermentation reactions place them in the species described by Hennelberg under the name, *L. Leichmani*. Glucose, fructose, and mannose are readily fermented. The fermentation of galactose is somewhat slower. Disaccharides are attacked to a lesser degree and trisaccharides are scarcely consumed at all. Considerable acid is formed from glucosides and from dextrin. Lactic acid is the major product of the fermentation. Only traces of volatile acid, alcohol and carbon dioxide are found. The lactic acid produced is active and laevorotatory.—*Authors' summary.*

2068. GRAFE, V. **Zur Physiologie und Chemie der Pflanzenphosphatide.** [Physiology and chemistry of plant phosphatides.] Biochem. Zeitschr. 159: 444-448. 1925.—The significance of phosphatides is discussed as possible constituents of the plasma membrane and



the cell wall, as the chromatic substance of the nucleus, as hormones of cell division and as parent substances of vitamins.—*H. D. Hooker.*

2069. GRAFE, V., UND V. HORVAT. **Die wasserlöslichen Phosphatide aus den Wurzel der Zuckerrübe. I.** [The water-soluble phosphatides of the sugar-beet root.] *Biochem. Zeitschr.* 159: 449-467. 1925.—A water-soluble phosphatide was extracted from the roots of sugar-beets that has the probable formula  $C_{79}H_{153}O_6P_2N$ , yielding 2 molecules of palmitic acid, 2 of oleic acid, 2 of glycerol, 1 of choline and 2 of phosphoric acid. Another water-soluble phosphatide was prepared that likewise contained fatty acid, glycerol, phosphate and choline radicles.—*H. D. Hooker.*

2070. GROVE, OTTO, AND F. SUMMERS. **Acidity and taste in apple juices.** *Univ. Bristol Ann. Rept. Agric. and Hort. Res. Sta.* 1923: 98. 1923.—This note reports a comparison of acidity of juice from different varieties of apples as measured by titration and by the electrometric determination of H-ion concentration. The varieties were not placed in the same order of acidity by the 2 methods. There was more nearly agreement with the filtered juices. The writers think that some of the filterable constituents depress the H-ion concentration but of course do not influence the amount of titrable acid.—*W. H. Chandler.*

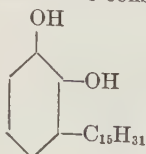
2071. HAGIWARA, SYÔZI. **Influence of metallic salts on the color of *Monascus purpureus* Went.** (Japanese.) *Rept. Dept. Industry, Govt. Res. Inst. Formosa* 5: (1-5). 1924.—If one adds to a pure culture of *Monascus purpureus* a minute quantity of a salt of arsenic, antimony or zinc, a beautiful, deep red color soon appears in the filaments, while the addition of a salt of tin induces a dark reddish orange color.—*Author (Courtesy Japanese Jour. Bot.).*

2072. HATANO, J. **Über die partielle Hydrolyse der Rohrzucker-phosphorsäure zu d-Fructose und d-Glucose-phosphorsäure.** [The partial hydrolysis of sucrose phosphoric acid to d-fructose and d-glucose-phosphoric acid.] *Biochem. Zeitschr.* 159: 175-178. 1925.—Dilute acids hydrolysed the calcium salt of sucrose phosphoric acid to d-fructose and the calcium salt of d-glucose phosphoric acid.—*H. D. Hooker.*

2073. IRVINE, J. C. **Problems involved in the chemistry of the sugars.** *Internat. Sugar Jour.* 27: 252-253. 1925.—Under the title, "Sugars from the standpoint of the organic chemist," there is described unpublished work on a molecule simpler than glucose, what glucose methylation has taught, and the constitution of cellulose; also the question as to whether synthetic starch has been made, is discussed. Among the unsolved problems which lie at the foundation of sugar chemistry are mentioned the cause to which the glucose molecule owes its optical activity, why the glucose configuration is favored to the exclusion of others, the chemical process in nature by which glucose is formed, and the manner in which sugars lose water.—*Nellie E. Fealy.*

2074. LING, ARTHUR R. **The chemistry of the sugars.** [Rev. of: (1) ARMSTRONG, E. FRANKLAND. *The simple carbohydrates and the glucosides* (Monographs on biochemistry). 4th ed. xi + 293 p. Longmans, Green & Co.: London, 1924.—(2) PRINGSHEIM, HANS. *Zuckerchemie* (Sugar chemistry). xii + 322 p. Akad. Verlagsgesellschaft m.b.H.: Leipzig, 1925.] *Nature* 116: 86-88. 1925.

2075. MAJIMA, RIKO. **Untersuchungen über den Japanlack.** [Investigations on Japanese lacquer.] *Iwata Inst. Plant Biochem. Publ.* 1. 1-154. 3 pl. 1924.—This is a summary of a series of investigations on urushiol, the principal constituent of Japanese lacquer from a lacquer tree, *Rhus vernicifera* DC. The chemistry of this substance has been investigated. Various derivatives have been prepared including the mono- and dimethyl ethers, the diacetyl derivative, and the hydrogen derivatives of each of these. The hydrogen derivatives are crystalline and therefore very important for the purification and identification of the different compounds. The constitution and position of the side chain has been determined



as the following:

The natural lacquer contains a number of homologues of

urushiol and lower pyrocatechol derivatives. The principal constituent of China lacquer, also from *Rhus vernicifera* DC. is the same as that from Japan. However, the lacquers from Indochina (*Rhus succedanea* L.), Formosa (*Semecarpus vernicifera*), and Tsutaurushi (*Rhus ambigua* Lav.) all contain laccol, a higher homologue of urushiol, while the lacquer from Burma (*Melanorrhoea usitata* Wall.) contains thitsiol an isomer of laccol.—C. M. Conrad.

2076. PACK, DEAN A. **Dispersion of lipoids.** Bot. Gaz. 79: 334-338. 1925.—In juniper seed, dispersion of the lipid content accompanied activities in germination. The dispersion reaches the limit of the microscope. Lipoid dispersion was found to precede lipid decomposition, absorption, translocation, and synthesis, which processes are aided by the dispersion. Attention is called to the highly dispersed condition of lipoids in growing animal tissues.—B. W. Wells.

2077. SIDERIS, CHRISTOS P. **The role of the hydrogen-ion concentration on the development of pigment in Fusaria.** Jour. Agric. Res. 30: 1011-1019. 1 pl. 1925.—The development of pigment by *Fusaria* is controlled mainly by the H-ion concentration of the surrounding culture solution. The writer grew various species of *Fusarium* in 2 sets of dextrose culture solutions at pH 3.0, 4.0, 5.0, 6.0, 7.0 and 7.5. In the one set the changes produced in the initial reaction of the various cultures by the metabolic products of the organisms were adjusted by the introduction of appropriate volumes of 0.2 normal solutions of either KOH or H<sub>2</sub>SO<sub>4</sub> at regular intervals. In the other set no introduction of reagents was made for an adjustment of the changes and so the reaction was shifted near the isometabolic point of the substance, namely, pH 4.0. In the adjusted set of cultures the writer observed that the production of pigment was restricted to the cultures of pH 4.0 and 5.0; while in the non-adjusted set, pigment was produced in all the different cultures. The production of pigment in the non-adjusted set of cultures is explained by the writer as being due to the favorable reactions produced by the metabolic products which enabled the organisms to generate appropriate chromogens and thus produce pigment. Plant tissues rich in assimilable carbohydrates were found to favor the development of a reddish-pink pigment, while tissues rich in assimilable proteins favored the development of a bluish or buff pigment. The pigment produced by the various organisms was either diffusible or non-diffusible, that is, it either passed into the surrounding solution or was retained within the cell. The various colors manifested by the pigment of these organisms were found to be due to variations in the H-ion concentration of the substratum. These variations were detected in solid dextrose agar media with various colorimetric pH indicators introduced in the media. It is possible to reproduce these various colors by treating some of the extracted pigment with different concentrations of H and OH ions.—Author.

2078. SØRENSEN, MARGRETHE. **On the determination of small quantities of phosphorus in proteins.** Compt. Rend. Trav. Lab. Carlsberg [Copenhagen] 15<sup>10</sup>: 1-6. 1925.—Colorimetric methods of determining phosphorus without precipitation as phosphomolybdate were found very susceptible to accidental external factors, and failed to give good agreement after precipitation. A method of precipitation with ammonium molybdate followed by titration was developed, by which a known quantity of phosphorus, not exceeding 1 mg. in 1 gm. of protein, could be recovered with an inaccuracy of less than 0.01 mg.; and duplicate analyses agreed to the same extent. The method consists in acid digestion of the protein solution, precipitation with molybdate and titration with N/10 NaOH.—F. Weiss.

2079. STARKEY, ROBERT L. **Concerning the carbon and nitrogen nutrition of Thiobacillus thiooxidans, an autotrophic bacterium oxidizing sulfur under acid conditions.** Jour. Bact. 10: 165-195. 3 fig. 1925.—The author found that although no organic substance in the absence of S or thiosulphate served as a source of energy to *Thiobacillus thiooxidans*, and although it would grow very well in a sulphur inorganic medium, still, in the presence of sulphur, small amounts of glucose were apparently utilized either as a source of energy or of carbon or both. Contrary to the statement of others, it was clearly shown that nitrates, urea, pepton, or glyocol are not available to this organism as a nitrogen source. Ammonium salts only are known to be utilized by *T. thiooxidans* as a nitrogen source. The nitrate ion showed very pronounced specific toxicity, decreasing the amount of sulphur oxidized to the carbon assimilated from CO<sub>2</sub>.—C. E. Skinner.



2080. TUTIN, F. **Pectin and its hypothetical precursor "protopectin."** Univ. Bristol Ann. Rept. Agric. and Hort. Res. Sta. 1923: 91-96. 1923.—This paper is reprinted from Biochem. Jour. 17: 510. 1923.—It was found that when unripe apples were finely and repeatedly ground with sand and given a number of washings after each grinding the amount of pectin obtained from the material left, by heating it in autoclave with HCl, was insignificant. He thinks, therefore, that with the apple there is no protopectin and that the increased yield of pectin generally resulting from heating the marc in an acid medium is due to disintegration of the cell walls and the release of the pectin rather than to a chemical change from protopectin to pectin. If the grinding were fine enough completely to separate the pectin from other cell wall tissue it could all be extracted without heating with acid; and it does not seem that the grinding could bring about the change from protopectin to pectin.—W. H. Chandler.

2081. WALTON, C. F., M. A. METCALF, AND W. F. HORNBERGER. **Laboratory experiments determining the inversion losses in cane sugar manufacture.** Internat. Sugar Jour. 27: 265-271. 1925.—The practice commonly followed in factories in connection with defecation, evaporation to syrup, and boiling syrup to massecuite were duplicated by the authors in laboratory experiments to determine inversion losses in cane-sugar manufacture, certain definitely specified conditions, especially as regards temperature and time, being selected arbitrarily. The experiments are described, and tables give the results of defecation of juice, defecation in lime juice, combined defecation of juice and evaporation to syrup, results of sugar boiling experiments, results of brush pan experiments (sulphur-lime syrup), and boiling 60° purity molasses blank. The tables are analyzed and indications to which results of the experiments point are mentioned.—Nellie E. Fealy.

2082. WOLFF, H. **Der Verwendungsstoffwechsel säurefester Bakterien. V. Über den quantitativen Verwendungsstoffwechsel des Timotheebazillus und des Trompetenbazillus.** [The metabolism of acid-fast bacteria. V. Quantitative requirements of timothy and "trumpet" bacilli. Biochem. Zeitschr. 158: 319-333. 8 fig. 1925.—Timothy bacilli made good growth with 0.1% phosphorus (potassium phosphate), nitrogen (ammonium chloride) and carbon (sodium acetate), with 0.01% magnesium (sulphate) and sulphur (sodium sulphate) and without sodium or potassium. "Trumpet" bacilli required 0.001% potassium (chloride) for good growth and made no growth without sulphur. On the basis of these data, optimal nutrient cultures for these bacilli were prepared.—H. D. Hooker.

#### METABOLISM (NITROGEN RELATIONS)

2083. FRED, E. B., AND W. H. PETERSON. **Forms of nitrogen in pure cultures of algae.** Bot. Gaz. 79: 324-328. 1925.—Using the technique developed by Schramm of isolating and growing algae on agar, the author found in the cases of *Chlorella vulgaris* and *Scenedesmus quadricauda* that the nitrogen in the dried algae is largely insoluble and amounts to 7.4% on the ash-free basis. About 25% can be extracted with water, and is made up chiefly of protein, amino, and peptide nitrogen. *Scenedesmus*, it was noted, grew much better in the absence of glucose than did *Chlorella*.—B. W. Wells.

2084. JODIDI, S. L., AND J. G. WANGLER. **Physiological and biochemical studies on cereals. IV. On the presence of amino acids and polypeptides in the ungerminated rye kernel.** Jour. Agric. Res. 30: 989-994. 1925.—The paper deals with 3 varieties: (1) North Dakota No. 959, (2) Von Rümker, and (3) Reg. Rosen rye. The proportion of ash and of total nitrogen, of protein N, and of non-protein N was in (1), respectively, 1.79, 2.41, 2.02 and 0.39; in (2) 2.11, 1.84, 1.58 and 0.26; in (3) 2.04, 1.65, 1.51 and 0.14, calculated on the basis of the oven-dried rye. To establish the nature of the non-proteins, the hot water seed extracts were concentrated *in vacuo* to dryness, extracted with 85% alcohol, the alcohol distilled off and again evaporated to dryness. The residual syrup was taken up with water and treated with H<sub>2</sub>SO<sub>4</sub> and phosphotungstic acids. The filtrate from the resulting precipitates was treated successively with Ca(OH)<sub>2</sub> and Ba(OH)<sub>2</sub> followed by CO<sub>2</sub>, and the final filtrate concentrated under reduced pressure to a definite volume (ordinarily 100 cc.) which was used for formol titration, which gave the percentage of amino acids. To find the proportion of polypeptides present, the final purified filtrate obtained as already outlined was treated with HCl to a

concentration of 20% and hydrolyzed under reflux for 12 hours. On removal of the ammonia by distillation with magnesium oxide, the residue was thoroughly extracted with hot water, concentrated and made up to a definite volume, which was used for formol titration. This yielded the percentage of polypeptides, plus amino acids. For the estimation of the acid amides the hydrolysis with HCl was effected for 30 minutes only. It was then distilled with magnesium oxide, which gave the ammonia corresponding to the acid amides. The rye varieties (1), (2) and (3) were shown to contain, respectively, 3.72, 4.96 and 4.14% of acid amide N, calculated to the total N; 3.09, 5.39 and 5.97% of amino N; and 6.69, 8.30 and 4.21% of peptide N.—*S. L. Jodidi.*

#### METABOLISM (ENZYMES, FERMENTATION)

2085. BRUNKOW, O. R., W. H. PETERSON, AND E. B. FRED. **A study of the influence of inoculation upon the fermentation of sauerkraut.** Jour. Agric. Res. 30: 955-960. 1925.—Inoculation of sauerkraut with selected cultures of lactic-acid bacteria altered the normal flora of the kraut and gave an improved product. The effect of inoculation is seen also in the products of fermentation. The inoculated kraut contained more lactic acid, less acetic acid and less ethyl alcohol than the uninoculated kraut.—*O. R. Brunkow.*

2086. GROVE, OTTO. **The influence of pressure during the later stages of the primary fermentation of cider.** Univ. Bristol Ann. Rept. Agric. and Hort. Res. Sta. 1923: 99-101. 1923.—Cider was fermented in soda fountain siphons and in bottles with fermentation traps that prevent the access of air and increase of pressure. Considerable pressure was developed in the soda fountain syphons, though the amount was not determined. The cider fermented under pressure cleared as rapidly as or a little more rapidly than the other and retained a higher specific gravity and a sweeter and more aromatic flavor, the fermentation process being less rapid. The author thinks the less aromatic flavor of the cider fermented at atmospheric pressure is due to the loss of esters of the fruit and those developed in fermentation, these being retained in fermentation at higher pressures. He was not able to collect esters in the gas given off from casks of fermenting cider.—*W. H. Chandler.*

2087. HAGIWARA, SYŌZI, AND NAOSI AOYAMA. **Researches on the enzymes of the "Anka" and of *Monascus purpureus*.** (Japanese.) Rept. Dept. Indust. Govt. Res. Inst. Formosa 5: 43. 1924.—In the "Anka" of Formosa and China, cultured at 37-38°C., the authors found the following enzymes: Amylase, emulsin, peroxidase, and lab ferment, but never lipase, urease, peptase, or oxidase. The presence of trypsin and protease was doubtful. In a culture held at 38-39°, amylase, maltase, emulsin, peroxidase and lab ferment were found, but not lipase, urease, protease, peptase or oxidase.—*Authors (Courtesy Japanese Jour. Bot.).*

2088. JACOBY, M., AND L. ROSENFELD. **Zur Kenntnis der Auxokörperwirkung. [The action of auxo-bodies.]** Biochem. Zeitschr. 158: 334-336. 1925.—In 60% alcohol, potassium cyanide retarded urease action.—*H. D. Hooker.*

2089. SAHASHI, Y. **Über das Vorkommen von Dihydroxy-chinolin-carbonsäure ( $\beta$ -Säure von U. Suzuki) in der Reiskleie. [The presence of dihydroxyquinoline carbonic acid (Suzuki's  $\beta$ -acid) in rice bran.]** Biochem. Zeitschr. 159: 221-234. 1925.—Suzuki's  $\beta$ -acid obtained from the antineuritic substance of rice bran by acid cleavage was prepared in larger amounts. Salts, esters, and acetyl, benzoyl, bromine and nitro derivatives were prepared and the presence of 2 hydroxyl and 1 carboxyl group was established. Quinoline was obtained by zinc dust distillation. Formulae are proposed for this dihydroxy quinoline carbonic acid ( $C_{10}H_7NO_4$ ).—*H. D. Hooker.*

2090. SJÖBERG, K. **Über das Pringsheimsche Komplement der Amylasen. [Pringsheim's amylase complement.]** Biochem. Zeitschr. 159: 463-471. 1925.—Pringsheim's amylase complement obtained from yeast was found to be stable at 80°C. In the presence of the complement, starch was changed to maltose completely. There was no maltase action.—*H. D. Hooker.*

2091. SLOBODSKA-ZAYKOWSKA, N. **Über die Anwendung des Milchsagar von Freudenreich bei der Untersuchung der Milchsäurebakterien. [The use of Freudenreich's milk-agar for investigation of lactic acid bacteria.]** Biochem. Zeitschr. 159: 216-220. 1925.—Freudenreich's milk-agar was found unsuitable for studying the proteolytic enzymes of cheese and



lactic acid bacteria, though it proved important in studying proteolysis by other micro-organisms.—*H. D. Hooker.*

2092. WELO, L. A., AND OSKAR BAUDISCH. Certain oxides of iron in some new catalytic actions. *Science* 62: 311-312. 1925.—Magnetite ( $\text{Fe}_3\text{O}_4$ ) is oxidized at  $330^\circ\text{C}$ . and becomes "active"  $\text{Fe}_2\text{O}_3$  with cubic crystals. If this new oxide is heated to  $550^\circ$  it becomes "inactive" and has a rhombohedral crystal. The magnetite and the "active  $\text{Fe}_2\text{O}_3$ " give positive benzidine tests and promote the growth of *Bacterium leptosepticum*. The latter property is associated with the absorption of oxygen. The "inactive  $\text{Fe}_2\text{O}_3$ " is unable to replace the "active  $\text{Fe}_2\text{O}_3$ " in the benzidine test or for growing bacteria but the action of the active forms cannot be explained on the basis of available energy from their crystal structure.—*C. J. Lyon.*

2093. ZAYKOWSKY, J., UND N. SLOBODSKA-ZAYKOWSKA. Chemischbakteriologische Faktoren beim Reifen der Käse. I. [Chemico-bacteriological factors in cheese ripening.] *Biochem. Zeitschr.* 159: 199-215. 1925.—Protein hydrolysis during cheese ripening lasts only during the life of the lactic acid streptococcus.—*H. D. Hooker.*

### METABOLISM (RESPIRATION)

2094. HUTCHINSON, H. P. The buffing of willows. *Univ. Bristol Ann. Rept. Agric. and Hort. Res. Sta.* 1923: 38-42. 1923.—A discussion of the browning of the willow wood that results after it has been boiled to facilitate peeling. The author thinks the browning is due to the oxidising of catechol and pyrogallol, decomposition products of tannin compounds. These substances absorb oxygen rapidly when in an alkaline medium; and it was found that buffing could be hastened by placing the peeled rods for a few minutes in an alkaline solution. With some varieties buffing could thus be greatly hastened.—*W. H. Chandler.*

2095. JOHNSTONE, G. R. Effect of wounding on respiration and exchange of gases. *Bot. Gaz.* 79: 339-340. 1925.—In studying plugged sweet potatoes as contrasted with the similar ones with the plugs replaced, the writer found a much higher rate of respiration in the former than in the latter. He ascribes the difference chiefly to the facility of gas exchange in the former rather than to wound stimulation.—*B. W. Wells.*

2096. ROSENOW, L. P. Über die Wirkung von Thyreoidin, Cerebrin und Cordin auf die anaerobe Atmung der Hefe. [The action of thyroïdin, cerebrin, and cordin on the anaerobic respiration of yeast.] *Biochem. Zeitschr.* 159: 235-239. 1925.—Anaerobic respiration of yeast was increased by small doses of thyroïdin, cerebrin, cordin and blood serum.—*H. D. Hooker.*

2097. STARKEY, ROBERT L. Concerning the physiology of *Thiobacillus thiooxidans*, an autotrophic bacterium oxidizing sulfur under acid conditions. *Jour. Bact.* 10: 135-163. 1 fig. 1925.—The author found that, following a short lag, sulphur was rapidly oxidized but concurrent with the accumulation of  $\text{H}_2\text{SO}_4$  in large amounts, the action later became slower. Under most favorable conditions for growth, the ratio of the S oxidized to the C assimilated, called S:C ratio, was 31.8. In the presence of 1 and 5%  $\text{H}_2\text{SO}_4$ , the S:C ratio was 36.6 and 43.0, respectively. Up to 3%  $\text{KH}_2\text{PO}_4$ , the S oxidation was independent of the amount of phosphate present. Up to 5.5%  $\text{KH}_2\text{PO}_4$ , the S:C ratio remained about 31.8. No appreciable stimulation to S oxidation was found with salts of Zn, Co, Ni, Hg, Pb, or Sn. Ni in concentrations of 25 parts per million distinctly depressed S oxidation. Rhombic, precipitated, and amorphous S were available to *T. thiooxidans*, but precipitated S was most rapidly oxidized.  $\text{CO}_2$  and  $\text{O}_2$  were necessary for chemosynthesis and S oxidation. By increasing the atmospheric pressure, the rate of S oxidation was increased. Oxidation was very slow at  $10^\circ$ , more rapid at  $20^\circ$ , optimum at  $27^\circ$ - $30^\circ$ , much slower at  $37^\circ$ , and at  $50^\circ$  the organism was killed. *T. thiooxidans* was not at all resistant to desiccation, but in inorganic liquid media containing S, lived for long periods without becoming attenuated. With  $\text{Na}_2\text{S}_2\text{O}_3$  as a source of energy instead of S, the S:C ratio was 50:60, whereas with S it was 31.8. Only 4.3-5.4% of the energy of the oxidation was utilized for the fixation of  $\text{CO}_2$  with  $\text{Na}_2\text{S}_2\text{O}_3$  as a source of energy, whereas with S it was much higher.—*C. E. Skinner.*

2098. WIND, F. Über die Oxydation von Dioxyaceton und Glycerinaldehyd in Phosphatlösungen und die Beschleunigung der Oxydation durch Schwermetalle. [The oxidation of dihydroxyacetone and glyceric aldehyde in phosphate solutions and the acceleration of oxydation by heavy metals.] *Biochem. Zeitschr.* 159: 58-67. 11 fig. 1925.—The oxidation of sorbose

and dihydroxyacetone was accelerated by increasing the concentration of phosphate, and by increased alkalinity. The oxidation of fructose and dihydroxyacetone was accelerated by the presence of copper and iron and retarded by potassium cyanide and by sodium pyrophosphate. Iron pyrophosphate had specific action in accelerating fructose oxidation.—*H. D. Hooker.*

#### ORGANISM AS A WHOLE

2099. CANCIK, J. A., AND N. MAZEPOVA. Direct cultivation of the *Mycobacterium tuberculosis*. Amer. Jour. Public Health 15: 679-680. 1925.—This is an account of the development of a new medium for the direct culture of *Mycobacterium tuberculosis*. It consists of an egg-beef infusion agar. Good results are claimed for the medium.—*C. A. Ludwig.*

2100. GREER, FRANK E. Anaerobes in sewage. Amer. Jour. Public Health 15: 860-867. 1925.—Methods of isolation and frequency in sewage in different stages of purification of *Clostridium Welchii*, *Cl. sporogenes*, *Cl. tetani*, *Cl. botulinum*, and "Vibrion septique" are given. The following conclusions are reported: "1. Anaerobes are present in sewage, but in smaller number than aerobes. 2. The most common anaerobes present in sewage are those species found in the intestinal tract of man. 3. In the samples examined, *Cl. Welchii* was the most common anaerobe found, *Cl. sporogenes* was found in less abundance, *Cl. tetani* and "Vibrion septique" were found in small numbers, and *Cl. botulinum* was found but once. 4. Treatment by the activated sludge process does not actually reduce the number of anaerobes to any extent. The sludge from an activated sludge plant contained more anaerobes than the foul sewage entering the plant. 5. *Cl. Welchii* survived this process better than *B. coli*. 6. Dried and pressed sludge may contain many anaerobes, mostly of the *Cl. Welchii* group."—*C. A. Ludwig.*

2101. HARTER, L. L. A physiological study of *Mucor racemosus* and *Diplodia tubericola*, two sweet potato storage-rot fungi. Jour. Agric. Res. 30: 961-969. 1925.—The secretion of pectinase by *Diplodia tubericola* and *Mucor racemosus* was studied on 10 different culture media. *Diplodia tubericola* did not secrete the enzyme but *Mucor racemosus* produced it on sweet potato, carrot, turnip, and string bean decoctions, but not on potato decoction or on Czapek's, Richard's, or Pfeffer's synthetic media. Both organisms secreted amylase, invertase, and raffinase but not cytase.—The investigation showed that the H-ion concentration of the substrates was increased in some cases and decreased in others. The 2 fungi did not necessarily produce similar results when grown on the same culture media. *Mucor racemosus* was found to be parasitic on sweet potato but not on turnips, carrots, or potatoes, but the enzyme pectinase was produced when the organism was grown on turnips and carrots.—*Author.*

2102. HOTCHKISS, MARGARET. Factors influencing the bacterial flora of an Imhoff tank. Amer. Jour. Public Health 15: 702-704. 2 fig. 1925.—An investigation is reported concerning the bacterial conditions in an Imhoff tank in New Jersey from December, 1923, through October, 1924. The samples were taken twice a week. The number of bacteria, as indicated by agar plate counts, showed a certain rhythmic variation, a peak usually occurring each month. The curve of albumin digesters parallels this to some extent but none of the others does. The curve for nitrate reducers (nitrogen gas producers) shows the greatest peaks in March and September, with lesser peaks in January and July. That for nitrate producers shows peaks in late January and in May. "The curve for nitrite producers does not seem very significant but it can be seen that it does not coincide with the nitrate curve." The hydrogen sulphide producers were most abundant in January and September. None of the curves suggests any relation with seasonal variations in temperature. The tank was alternately operated and rested, the resting being for the control of foaming. "It seems fair to say that the bacteria increase in the liquid of an operating tank and decrease during a resting period," although the statistical methods used and the complications of sludge drawing and pumping, which reduce the bacterial count, make it difficult to determine the effect of operating and resting periods. The increase in the number of albumen digesters in June was possibly a temperature effect. "A study of the growth curves for the different groups of bacteria suggests that there are various phases in the digestion of the material in



the tanks in which a succession of bacteria take a predominant part. It is seen that variations in the manner of operating the tanks influence the general bacterial flora and tend to obscure any seasonal variations which may occur."—*C. A. Ludwig.*

2103. JOHNSTON, EARL S. **The seasonal march of the climatic conditions of a greenhouse, as related to plant growth.** Maryland Agric. Exp. Sta. Bull. 245. 41-98. 7 fig. 1921.—The study is an attempt to measure and integrate the climatic conditions of a greenhouse by means of various measurements taken from standard plants, as these conditions varied throughout the year. These same conditions were also measured and integrated in terms of instrumental data.—The general method was to grow buckwheat plants in water cultures placed on rotating tables for exposure periods of 4 weeks. A new period began every 2nd week so that 2 successive periods overlapped. Plant and instrumental measurements were made from 2 series of tests, one under ordinary unshaded greenhouse conditions at Baltimore, the other within a cheese-cloth enclosure in the same greenhouse.—The approximate annual ranges of the 4-week growth rates (ratios of maximum to minimum) were as follows: Rate of stem elongation, 2; rate of dry-weight increase, 8; rate of leaf-area increase, 5; rate of transpirational water loss, 9. The greenhouse climate during the year of this study appeared to have been most favorable to the general growth of these plants during 2 separate periods, one in early summer, the other in late summer. The climatic efficiency for producing growth was lowest during the winter period. Even with the usual application of artificial heat, the winter efficiency for plant growth remained very low. A general agreement was found between the radiation values and the areal coefficients of weight increase and of transpiration, but there was no very marked agreement between the radiation values and those of the water requirement. It appeared that the climatic conditions effective during the first 2 weeks of each test predetermined, in general, the rates of stem elongation for the succeeding 2-week period. The buckwheat plants appeared to have been much more sensitive to climatic influences during the first 2 weeks than during the second.—*Author.*

2104. KANOUSE, BESSIE B. **Physiology and morphology of *Pythiomorpha gonapodioides*.** Bot. Gaz. 79: 196-206. Pl. 12-13. 1925.—*Pythiomorpha gonapodioides* is said to be very sensitive to unfavorable environmental conditions, improper temperature and food supply readily inducing abnormal morphological development. A method of culture which brought about normal development of mycelium and fruit bodies is presented. The transfer of well nourished mycelium to conductivity water induced the formation of an abundance of zoosporangia which discharged zoospores that were immediately capable of movement. The same treatment induced sexual reproduction. Oogonial formation followed sporangial production in single zoospore cultures and cultures arising from single oogonia produced typical zoosporangia. This study is said to confirm the observation of Peterson that *Pythiomorpha* differs from *Pythium* in the absence of a vesicle membrane which in *Pythium* encloses the expelled sporangial protoplasm and within which the zoospores are formed, and that in *Pythiomorpha* the zoospores are not surrounded by a vesicle membrane but are capable of movement at once, after escaping from the sporangium. The contention of von Minden that *Pythiomorpha* possesses a vesicle membrane similar to that of *Pythium* is attributed to abnormal cultural conditions. A careful description of *Pythiomorpha gonapodioides* grown under optimum conditions is given.—*S. G. Lehman.*

2105. MALLMANN, W. L. **Old stock cultures as a source of bacteriophage.** Jour. Bact. 10: 59-61. 1925.—A large number of old stock cultures of pathogenic and non-pathogenic bacteria were examined for the bacteriophage with negative results.—*C. E. Skinner.*

2106. TAKEDA, YOSITO. **Chemical and mycological investigations concerning species of *Rhizopus*.** (Japanese.) Rept. Dept. Research Inst., Formosa 1924: 1-49. 5 pl. 1924.—Pure cultures on rice of *Rhizopus Oryzae* Went & Prinsen Geerlings, *R. V Nakazawa*, *R. formosensis* Nakazawa, *R. chinensis* var. *rugosporus* Nakazawa, *R. pseudochinensis* Yamazaki, *R. humilis* Yamazaki, and 4 other species were shaken twice daily, held at a temperature of 33°C. and their behavior observed. Under these conditions the fungi showed most favorably their activity in the liquefaction and conversion of starch. The development of an aerial mycelium and of sporangia was very slight. The assumption of Nakazawa that *R. Oryzae* and *R. V Nakazawa* belong to the same species was confirmed. Among the species

investigated by the present author *R. Pêka* I n. sp., which is used in Formosa in the preparation of an alcoholic drink "Biityù," is distinguished by a very great capacity to liquefy and convert rice starch. A diagnosis of this species is given and its chemical behavior described at length. There is likewise an extended description of another fungus, *R. Pêka* II n. sp.—*Author (transl.) (Courtesy Japanese Jour. Bot.)*.

2107. WALKER, LEVA B., AND EMMA N. ANDERSON. Relation of glycogen to spore-ejection. *Mycologia* 17: 154-159. Pl. 18. 1925.—Before the discharge of the glebae of *Sphaerobolus stellatus* takes place, the glycogen in the inner peridial region becomes transformed into sugars with high osmotic pressure. Under temperatures of about 90°F. and bright light, the change in pressure is sudden, and the inversion of the inner peridium may throw the glebal mass over 14 feet vertically. The change of glycogen to sugars was found to occur also in *Peziza vesiculosa*, *Lasiobolus*, *Pilobolus*, *Coprinus* spp., and several other fungi.—Notes are given on the morphology of *Sphaerobolus*, and on the changes the glycogen undergoes.—*G. R. Bisby*.

### GROWTH, DEVELOPMENT, REPRODUCTION

2108. LODEWICK, J. ELTON. Growth studies in forest trees. III. Experiments with the dendrograph on *Fraxinus americana*. *Bot. Gaz.* 79: 311-323. Fig. 1-2. 1925.—In accordance with previous suppositions, it was found that the noon depression in diameter was greatest when the tree was in full leaf, indicating a water relation here. Correlations with precipitation and temperature likewise were observed. Histologically, it was found that the xylem elements at the base of the trunk were first differentiated simultaneously with the breaking of the leaf buds, and xylem growth ceased about August 1st. Phloem formation began 3 weeks after the xylem and continued until defoliation, on September 22nd. A rest period of 10 days was noted in early June, which seemed to be unrelated to environmental conditions.—*B. W. Wells*.

2109. MURNEEK, A. E. Correlation and cyclic growth in plants. *Bot. Gaz.* 79: 329-333. 1925.—Based upon experimentation with the tomato, the author points out as a correlation phenomenon the significant rôle played by fruits in inhibiting vegetative growth. "The rate of vegetative growth appears to be controlled by the developing fruit." In answer to the query concerning the nature of the correlation mechanism, the author suggests, in the absence of any proof of an internal secretory system, that the mechanism may be that of "different stages of localized nutrition" and that "the carbohydrate-nitrogen relations" proposed by Kraus and Kraybill may be used as a key in interpreting these rather striking conditions of growth in plants.—*B. W. Wells*.

2110. SUMMERS, F. Factors governing fruit-bud formation. VI. The stimulation of bud growth in cuttings by inorganic and organic solutions. *Univ. Bristol Ann. Rept. Agric. and Hort. Res. Sta.* 1922: 32-36. 1922.—Apple twig cuttings containing 11-14 buds were used. Lots of 5 cuttings were placed with the ends in beakers containing 0.5% sucrose, glucose, and fructose, or in 5% diastase or in tap water. These were placed in a partial vacuum to remove air from internal spaces when normal pressure was gradually restored, the purpose being to increase the penetration of the solutions. During the first 40 days buds from all injected cuttings, including those injected with tap water, were more advanced than were buds from non-injected cuttings. After 3 weeks buds injected with sugar solutions came to be more advanced than those injected with water. A 2nd injection seemed to increase the effect of the sugar. With the cuttings treated with glucose or fructose, basal buds developed more rapidly than distal ones; but with cuttings treated with sucrose this was not true. Injection of diastase into the bud by means of a hypodermic syringe stimulated growth in buds that probably would otherwise have remained dormant; but the growth was weak and slender.—*W. H. Chandler*.

### MOVEMENTS OF GROWTH AND TURGOR CHANGES

2111. CHRISTIANSEN, MARIE. Bibliographie des Geotropismus. 1919 bis 1924 und Nachtrag III. [Bibliography of geotropism. 1919-1924 and Supplement 3.] *Mittel. Inst. Allg. Bot. Hamburg* 6: 127-148. 1924.—The principal work, including the years 1672-1916, appeared in the same place in 1917, Suppl. 1 in 1918, and Suppl. 2 in 1919.—*Author*.



2112. DENECKE, WILLY. *Untersuchungen über den Phototropismus von Laubblättern.* [The phototropism of green leaves.] (Dissertation Hamburg. Universität.) Mitteil. Inst. Allg. Bot. Hamburg 6: 71-126. 4 fig. 1924.—From some experiments, especially those with *Malva neglecta*, the author draws certain conclusions: Petiole and leaf blade are capable of phototropic stimulation. In the petiole as in young axillary organs, a zone of strong sensitivity occurs in the region of most rapid growth-elongation and changes acropetally with this. The leaf surface is induced to place itself perpendicularly to the direction of the incident light rays, and it is of no consequence upon which side and in what position the leaf may be stimulated. There also occurs, especially in very young leaves and with increased stimulation, a negative movement, whereby the angle of the incoming light is reduced. Increasing the light intensity or the time of illumination, or even the illuminated leaf surface, acts in the same way as increasing the stimulus. The direction of the light is perceived at any angle. Obviously, however, it is best perceived at medium and oblique angles. The stimulus is conducted from the leaf surface to the petiole through the principal leaf "veins." The reaction of the leaves remains under the continual influence of environmental factors to which these leaves respond in manifold, complicated movements.—*M. Christiansen (transl.)*.

2113. HEINRICHER, EMIL. *Die Schlafbewegungen der Blütenkörbchen von Dimorphothea pluvisialis (L.) Much.* [The nyctinastic movements of the flower heads of *Dimorphothea*.] Sitzungsber. Akad. Wiss. Wien [Math.-Nat. Kl.] Abt. 1. 133: 87-135. 5 fig. 1924.—A previous study of the nyctinastic movements of *Dimorphothea* seems not to have been made, though those of related Compositae are known. In the present study the effect of light and darkness, temperature, constant light, and various innate factors, as age and condition of the flowers, upon these movements were observed in comparison with *Calendula*, *Leontodon*, etc. A summary of conclusions follows: The influence of alternate light and darkness is completely overshadowed by that of temperature, differing from *Calendula* and other Compositae which react partly or exclusively to light. Opening of *Dimorphothea* heads begins at 17°, and closes at 8-9°C. These movements may be induced in either continuous daylight or darkness. A stronger stimulus (higher temperature) is necessary to cause heads to open, which have closed after opening, as in late afternoon, than is necessary for heads which have been artificially kept closed all day. A constant state of closure may be maintained below 14°, and probably constant openness above 28°, but at intermediate temperatures, if constant, a periodicity dependent on light intensity comes to expression. Neither high humidity nor immersion in water suppresses the temperature influence, and natural closing during rainfall is attributed to lowering of temperature. The age of the inflorescence, the individuality of the plant, and its state of vigor influence the amplitude of the response.—*F. Weiss*.

2114. TEODORESCO, E. C. *La volubilité à l'obscurité.* [Twining in darkness.] Rev. Gén. Bot. 37: 212-232, 261-270, 303-320, 360-368. 1925.—The experiments presented show that the etiolated branches of twining plants are capable of carrying out in the dark the nutations and twining movements which the green branch does in the light. In both cases the movements occur with greater energy when the external conditions are more favorable to growth. The differences between twining in the light and in the dark are rather slight and proceed from the different states of the tissues developed under the different conditions. There is a rigidity in the etiolated branches which renders the movements less easily executed in the dark. This partial impediment is more visible in thickened branches; slender branches twine as readily in the dark as in the light. The plants used belonged to the following species: *Dioscorea batatas*, *Mandevilla suaveolens*, *Phaseolus vulgaris*, *P. multiflorus*, *Boussingaultia baselloides*, *Polygonum dumetorum*, *P. Convolvulus*, *Periploca graeca*, *Thunbergia alata*, *Ipomoea purpurea*, *I. sibirica*, *Loasa lateritia*, *Apios tuberosa*, *Solanum dulcamara*.—*J. C. Gilman*.

2115. ZIMMERMANN, WALTER. *Ueber die längsangreifende Schwerkraft und das Sinusgesetz.* I. Experimente an Wurzeln. [The effect of the axially acting force of gravity and the sinus law. I. Experiments with roots.] Ber. Deutsch. Bot. Ges. 42: (39)-(52). 1924.—The 1st part of the paper deals with the experimental investigation of the relationship between the force of gravity acting parallel with the longitudinal axis of an organ and the "sinus law." It was found that the force of gravity acts in a geotonic manner in that it modi-

fies the preceding geotropic stimulation (polar modification of the sinus law). If, for example, roots are made to rotate uniformly vertically to the horizontal axis of the klinostat; they do not remain straight, as has always been assumed, but they curve instead. The inverse vertical position will strengthen a preceding geotropic stimulation, while the normal vertical position will decrease it. This fact has also been proved by numerous direct experiments. Observations on the horizontal microscope showed an undulating geo-growth reaction. The 2nd part of the paper constitutes a critical consideration of previous works.—*Author (transl. by Ernst Artschwager).*

#### GERMINATION, RENEWAL OF ACTIVITY

2116. HARTT, CONSTANCE E. Conditions for germination of spores of *Onoclea sensibilis*. Bot. Gaz. 79: 427-440. Pl. 29, fig. 1. 1925.—Spores germinated best in intense, diffuse, red lights and at a temperature of 28°C. It was found that the spores retained the ability to germinate in the light longer than the ability to germinate in the dark. Age was found to be a significant limiting factor.—*B. W. Wells.*

2117. KNUDSON, LEWIS. Physiological study of the symbiotic germination of orchid seeds. Bot. Gaz. 79: 345-379. 1925.—Attacking the problems centering around the rôle of fungi in orchid development, the author reports the results of a series of experiments which indicate the following: *Rhizoctonia repens* Bernard induced germination of *Cattleya* seed on a medium containing starch, and accelerated the growth of orchid seed in a nutrient solution containing sucrose. The fungus could effect germination without infecting the seed, due to its ability to digest starch in the medium and modify the H-ion to a value favorable for growth. On a peat and sphagnum mixture with nutrient solutions adjusted to pH 4.6, germination was just as rapid as with the fungus present. Other fungi could function as indirect agents in germination. The fungus from *Cattleya*, *Epipactis* and *Cypripedium* was pathogenic to seed of *Odontoglossum*. The results are all in accord with the author's earlier data showing the necessity of organic food (sugar) in the substratum, if germination is to take place.—*B. W. Wells.*

2118. NAKAZAWA, RYÔDI, AND TOKUMATU KOBAYASI. Duration of germinability in spores of some slime fungi. (Japanese.) Rept. Dept. Indust., Govt. Res. Inst. Formosa 5: (1-4). 1924.—The question as to how long spores in the dry condition could retain their germinability was investigated in 61 species of slime fungi. The results are given in tabular form.—*Author (Courtesy Japanese Jour. Bot.).*

2119. ROSA, J. T. Shortening the rest period of potatoes with ethylene gas. Potato News Bull. 2: 363-365. 1925.—Exposure of seed potatoes to ethylene in concentration of 1 to 1000 down to 1 to 100,000 for 4 weeks resulted in marked stimulation of sprouting in 3 varieties representative of different durations of natural rest period. Besides sprouting in greater numbers within 1 month after planting, treated seed produced a larger number of stalks, whereas ordinarily tubers which are forced to grow before completion of the rest period, produce single or a small number of sprouts. Preliminary tests indicate the effectiveness of an exposure for 5 days in a concentration of 1 to 5000. This treatment could be carried out in bulk in cars or warehouses and is considered more effective than soaking in nitrate solutions.—*F. Weiss.*

2120. RUDOLFS, WILLEM. Influence of water and salt solution upon absorption and germination of seeds. Soil Sci. 20: 15-37. 5 fig. 1925.—This is a study of the stimulating effects of salt solutions of known osmotic concentration upon seed soaked in these solutions; of the injurious effects upon germination of seed in continuous contact with salt solutions, as compared with germination in distilled water and with that of seed which were not previously soaked; and the effect of temperature upon absorption, germination, and root-and-shoot-growth of seed kept in contact with the salt solutions.—Previous soaking in distilled water was harmful to the germination of all seed, corn being the least affected.—Stimulating effects: With the relative decrease in absorption, germination, and, subsequently, root-growth and top-growth, decreased for all seeds. A number of seed absorbed more in weak solutions than in distilled water, thus making longer roots and shoots. Relative weight of the seed and relative length of the roots and shoots is of minor importance for early growth when seed



are soaked.—In general, constant contact with salt solutions is injurious to germination and root-growth, and except for some of the weaker solutions these decreased with the increase in concentration.—Control of temperature and of the time factor made no principal difference in the relative absorption nor in root-growth, but affected the rate of absorption.—The influence of salt solutions upon the rapidity of germination is not the same for all seed. Corn and peas soaked in  $\text{NaNO}_3$  were retarded for the first 24 hours, but wheat and alfalfa germinated more quickly during the same period, as compared with germination in distilled water.—Peas, alfalfa, lupine, buckwheat, and watermelons are far more sensitive to the influence of salt solutions than corn and wheat.—*Author.*

### REGENERATION

2121. ANONYMOUS. A quantitative study of regeneration in plants. [Rev. of: LOEB, JACQUES. *Regeneration: from a physico-chemical viewpoint*.  $x + 143$  p. McGraw-Hill Book Co.: New York & London, 1924 (see Bot. Absts. 14, Entry 3009).] *Nature* 116: 90-91. 1925.—“His point of view brings him sharply into conflict with many views in great favor at the present day and is perhaps none the less valuable for that.”—*O. A. Stevens.*

2122. BIRMINGHAM, W. A. Adventitious roots in potato and tomato. *Agric. Gaz. New South Wales* 36: 595-596. 4 fig. 1925.

### TEMPERATURE RELATIONS

2123. COSTER, CH. Eendagsorchideeen. [One-day orchids.] *Tropische Natuur* 1925<sup>8</sup>: 121-126. Fig. 1-2. 1925.—This article deals with investigations about the fact that the “duifjes” (“pyeons,” a vernacular name for a tropical one-day orchid) usually blooms 9 days after a rain following a longer or shorter period of dry weather. Several investigators have already tried to force this orchid into bloom by the different methods applied in Europe and elsewhere to stimulate plants into early bloom or development of the leaves. No success was ever attained by such methods, nor by an investigation of the influence of the electric phenomena which usually accompany showers of rain. Finally, from the observation that a shower is often accompanied by a considerable decrease of temperature (up to 5-8°C.) and consequently also by an increase of humidity, these effects were investigated. In the interaction of these factors the explanation of the phenomenon seemed to be found. When a plant, in a suitable stage of growth, of one of the many orchid species, which show this phenomenon, was dipped for some hours in a water-bath of about 20°C. the buds developed and the plant blossomed after a certain definite period. Further experiments were made with buds of the *Thrixspermum arachnites* Rehb. f., which for various reasons is more suitable than the “pyeons.” It was possible to force *Thrixspermum* and “pyeons” into bloom by mere cooling while the plants themselves were put in a glass vessel with quick lime. So it appeared that cooling was the only stimulant and that increase in humidity was inessential. However, the drier the atmosphere is just before the shower, the greater the evaporation and the greater the temperature decrease, all of which stimulates intensified blossoming of the plant. A shower which falls by night, when the air is already fairly saturated with moisture, has no influence on the blossoming of the plants. This is illustrated with a table of rainfall and temperature figures. When during the shower the plants are protected from cooling by putting them, for example, in a closed room, no blossoming of the plants will be obtained.—*Jeanne Van Amstel.*

2124. HALMA, F. F., AND H. S. FAWCETT. Relation of growth of *Helminthosporium sacchari* to maintained temperatures. *Phytopathology* 15: 463-469. Fig. 1-3. 1925.—*Helminthosporium Sacchari* was grown on nutrient agar and standard bouillon at 8 temperatures between 13.5° and 36°C. On agar plates the increase in diameter of the colonies was measured daily during 10 days. On broth the mycelium was allowed to grow 10 days, filtered out, air dried, and weighed. Growth occurred at all temperatures tried except 36°. The optimum temperature for growth on both solid and liquid media was found to lie between 20° and 29°C.—*B. B. Higgins.*

2125. HEILBRUNN, L. V. The use of temperature coefficients in the interpretation of biological processes. *Science* 62: 268-269. 1925.—This is an adverse criticism of recent

attempts at the identification of temperature coefficients of living processes with those of specific chemical reactions. The problem is said to be too complex to allow such analyses.

—C. J. Lyon.

2126. SANDERSON, E. S. **Effect of freezing and thawing on the bacteriophage.** *Science* 62: 377. 1925.—Alternate rapid freezing and thawing of bacteriophages active for *Staphylococcus muscae* (Glaser) and for a human strain of *Bacterium coli*, respectively, showed that the lytic substance either is not a viable organism or is an exception to the rule that living cells are injured by such treatment.—C. J. Lyon.

### RADIANT ENERGY RELATIONS

2127. ASO, KEIJIRÔ AND UMEJIRO MURAI. **An experiment on the promotion of plant growth by the influence of electric light.** (Japanese.) *Jour. Sci. Agric. Soc.* 254: 31-36. 4 fig. 1924.—The experiments were made on barley and peas to test whether their growth may be appreciably promoted by the action of electric light, without increasing the quantity of CO<sub>2</sub>. Plants were illuminated during the night by an electric light of 100 candle power. It was found that (1) the growth is much quicker in the night-illuminated than in the control plants, (2) the development of inflorescences takes place much earlier, and (3) the length and weight of different parts are much greater.—Authors (*Courtesy Japanese Jour. Bot.*).

2128. BLAUW, A. H., AND W. VAN HEYNINGEN. **The radium growth-response of one cell.** *Proc. Roy. Acad. Sci. Amsterdam* 28: 1-15. 1925.—It has been previously observed that unicellular organs such as the sporangiophores of *Phycomyces* and some multicellular organs of higher plants respond to light stimulation with characteristic accelerations and retardations of growth. The authors investigated whether the growth of unicellular sporangiophores, so sensitive to visible light, are also affected by radium-rays. Experiments were made in a spacious dark room kept constantly at 17 to 17.5°C., a temperature in which all previous light experiments were made. The radium preparation contained 9.55 mgm. of the element radium and was enclosed in a glass tube and a silver one, the latter 0.5 mm. thick. After the first experiments the silver tube was enclosed in a case of lead with walls 2 mm. thick. Extensive tables show the relation of the radium to plant growth. The radium growth-response is contrary to the light growth-response and is actually as follows: It begins with a strong decrease in growth, then, on account of a contra-reaction, it passes into an acceleration of growth, while finally, with permanent exposure the growth becomes normal. The radium growth-response acts more quickly than the light growth-response. It is perceptible after an average of 2 minutes, the response to light averaging 3½ minutes. The greatest response after radium exposure is reached after about 5½ minutes, the minimum of growth after light exposure averaging about 7 minutes. Under continued one-sided exposure the usual phototropic curvatures soon appear. It is shown that radium growth-response is caused by the gamma-rays, not by the beta-rays. With a 4-sided illumination of 4 M.K., the sensitiveness to light being decreased to 1/10,000, the radium growth-response continued the same. It is very probable that the initial influence of the light-rays and the gamma-rays is of quite a different nature or at least exercises a different influence on the process of metabolism. The possibilities of this striking radium growth-response are emphasized. This phenomenon may be important in human physiology and therapy; the cell responses serve as extremely sensitive indicators of the effect of the gamma-rays and possibly of other rays. These cell responses are of value in the quantitative comparison of the effects of intensity, distance, time, and continuity of the applications of such radiations.—J. C. Th. Uphof.

2129. KOMURO, HIDEO. **The cells of *Vicia faba* modified by Röntgen rays, and their resemblance to malignant tumour cells with the cytological observations of tumours.** *Japanese Jour. Bot.* 2: 133-156. 2 pl., 12 fig. 1924.—(See also *Bot. Absts.* 14, Entries 1186 and 1187.)

2130. NIETHAMMER, A. **Über die Wirkung von Photokatalysatoren auf das Fröhrtreiben ruhender Knospen und auf die Samenkeimung.** [The action of photo-catalysers on bud forcing and on seed germination.] *Biochem. Zeitschr.* 158: 278-305. 3 fig. 1925.—Resting buds of *Syringa vulgaris*, *Prunus avium*, *Sambucus nigra*, *Aesculus Hippocastanum*, *Betula verrucosa*, *Quercus pedunculata*, *Tilia parvifolia*, *Fagus sylvatica*, *Acer platanoides*, *Alnus glutinosa*, *Robinia pseudoacacia*, etc., were bathed in or injected with eosin, erythrosin, or methylene



blue (1:5000 to 1:20,000), ferric, ferrous, or uranyl sulphate (0.5 or 1.0%). Under continuous illumination with 300 Hefner candles the treated buds broke 1-10 days before checks treated with distilled water. Light-sensitive seeds of *Apium graveolens*, *Epilobium hirsutum*, *Oenothera biennis*, *Digitalis lutea*, *Pisum sativum*, etc., showed higher percentages of germination when similarly treated at sufficient dilution. Natural photocatalysers are supposed to obtain in buds and seeds.—*H. D. Hooker*.

2131. OLTMANN, FRIEDRICH. *Über Licht- und Farbensinn niederer Organismen*. [Light and color perception in lower organisms.] (An address.) Ber. Freiburger Wiss. Ges. 8. 1-16. 1921.

2132. SEELIGER, RUDOLPH. *Ueber den Einfluss des Lichtes auf die Samenkeimung bei der Weinrebe*. [Influence of light on germination of grape seed.] Weinbau und Kellerwirtschaft 2: 85-86. 1923.—The seed of grape are capable of germination in the dark but are stimulated by light. In the case of fruit still containing the seed the influence of light was not discernible. The mechanism of the light effect is still unknown. Germination can be hastened by placing the seed on moist peat in a glass container covered with a plane piece of glass and placed in light for a period of about 4 weeks and then transferring to germinating boxes containing soil. The peat has a slightly acid reaction, thereby preventing growth of fungi on the seed.—*W. J. Himmel*.

#### TOXIC AGENTS

2133. ALLISON, F. E., J. J. SKINNER, AND F. R. REID. *Toxicity studies with dicyanodiamide on plants*. Jour. Agric. Res. 30: 419-429. Pl. 1-2, fig. 1-3. 1925.—A report is given of greenhouse studies undertaken to determine the degree of toxicity of dicyanodiamide for wheat and cowpeas and to learn if the toxicity is related to nitrate starvation. A very marked difference in the resistance of the 2 crops to dicyanodiamide was found to exist; the injury to wheat was only slight even at the high concentration of 40 pounds of the ammonia equivalent per acre, producing only a slight burning of the tips of the leaves; while in the case of cowpeas, 5 pounds of ammonia as dicyanodiamide was decidedly toxic, and decreased germination and death of many of the cowpea plants occurred in the presence of the larger applications. The addition of sodium nitrate to pots of growing wheat receiving dicyanodiamide did not prevent the leaf tip-burning, but, on the other hand, the latter material did not markedly decrease the value of the sodium nitrate. In the case of cowpeas a small amount of dicyanodiamide was very harmful whether in the presence or absence of nitrate nitrogen. These results indicate that dicyanodiamide is not a strong direct poison for wheat but is merely unavailable as a plant food, and probably prevents the proper release of the soil nitrogen. It is undoubtedly very directly harmful for cowpeas.—*F. E. Allison*.

2134. FEHÉR, D., UND S. VÁGE. *Untersuchungen über die Einwirkungen von Na<sub>2</sub>CO<sub>3</sub> auf Keimung und Wachstum der Pflanzen*. I. [The action of sodium carbonate on germination and growth.] Biochem. Zeitschr. 158: 357-365. 1925.—Over 0.4-0.5% by weight of soda inhibited germination and growth of wheat, barley, rye, oats, *Pinus sylvestris*, *P. nigra*, *Ailanthus glandulosa*, *Robinia pseudoacacia*, etc. Concentrations of 1.5% inhibited growth in sandy soil. Woody plants were more sensitive than grains. Humus reduced the toxic action of soda by reducing the hydroxyl-ion concentration. Absorption was low, being 0.005 gm. soda per plant from 0.4% solution after 2 weeks.—*H. D. Hooker*.

2135. GROVE, OTTO. *The influence of different salts and acids upon the growth of the cider sickness bacillus*. Univ. Bristol Ann. Rept. Agric. and Hort. Res. Sta. 1923: 106-107. 1923.—It is known that acids inhibit or prevent the growth of this bacillus in cider; and it is thought by some that a low salt content in the cider favors the growth of the bacillus. Trials with cultures of this organism in yeast-water containing 5% glucose indicated that while all acids at concentrations as low as 0.5%, H<sub>2</sub>SO<sub>4</sub> 0.05%, salicylic acid 0.07%, and tartaric as low as 0.3% prevented its growth; the salts, potassium tartrate, KCl, K<sub>2</sub>SO<sub>4</sub>, Na<sub>2</sub>SO<sub>4</sub>, CaSO<sub>4</sub>, and CaCl<sub>2</sub> at concentrations of 1% did not prevent growth. Growth was prevented by NaCl at a concentration of 0.7%, sodium benzoate at a concentration of 0.5% and MgCl<sub>2</sub> at a concentration of 0.3%.—*W. H. Chandler*.

2136. KLISSIUNIS, N. *Über die antiseptische Wirkung des Kupferchlorids in Lösungsmitteln verschiedener Dielektrizitätskonstante*. [The antiseptic action of copper chloride in

solvents of various dielectric constants.] *Biochem. Zeitschr.* 159: 107-109. 1925.—Copper chloride dissolved in isoamyl, propyl or isopropyl alcohol and acetone had no antiseptic action. Dissolved in ethyl or methyl alcohol, glycol and water, the same copper content had antiseptic properties.—*H. D. Hooker.*

2137. McGUIGAN, HUGH. **The action of furfural.** *Jour. Pharm. and Exp. Therap.* 21: 65-75. 1923.—The action of furfural on bacteria, yeast, gold fish, frogs, white mice, rabbits, cats and dogs is discussed. Furfural has a bactericidal action, its phenol coefficient being 0.26; a 2% solution inhibits the action of yeast on dextrose; in large doses it has a paralytic effect on animals and in smaller doses produces a variety of symptoms.—*David McC. De Forest.*

2138. MUNN, LOTTIE E., AND B. S. HOPKINS. **Studies on tellurium. The value of some tellurium compounds as disinfectants.** *Jour. Bact.* 10: 79-86. 1925.—A number of tellurium compounds have high disinfecting power in the absence of organic matter. In the presence of organic matter some of the compounds have little value; however, silver ammonio-tellurite is more effective than  $\text{AgNO}_3$  in the presence of organic matter. Potassium iodotellurite gives promise as an effective skin and wound disinfectant.—*C. E. Skinner.*

2139. NICHOLS, HENRY J., JAMES S. SIMMONS, AND A. PARKER HITCHENS. **Bacteriological data on the chlorine treatment of respiratory diseases.** *Amer. Jour. Public Health* 15: 699-701. 1925.—“The chlorine treatment, in our hands, gives no evidence of even partial sterilization of the mucous membranes of the upper air passages. It does not kill *B. prodigiosus* sprayed on these membranes. We are of the opinion that, in the doses used, the chlorine is neutralized and becomes inert, and that effective doses are too toxic.”—*From Author.*

#### MISCELLANEOUS

2140. ARMSTRONG, C. F. **Experiments on the clarification of cane juice using the “Stream-line” filter.** *Internat. Sugar Jour.* 27: 424-426. 1925.—As a large percentage of factories are equipped for ordinary defecation the author believed that the application of the “Stream-line” filter could best be effected by using it directly after defecation, without waiting for the sediment to settle, and conducted experiments with a view to determining this question. The experiments are described, and are believed to demonstrate that the filter would be most useful in the early stage, that is, for the diluted juice from the mills after it is defecated. This would do away with the large ranges of subsiding tanks and scum presses, and obviate holding large quantities of hot juice in tanks, thus greatly reducing the filtering area and eliminating the noisome scum station and the expense of new cloths for filter presses. The loss of sucrose in the scums can be dealt with by allowing the scums to fall into a receptacle, diluting them with water, and filtering the mixture through another “Stream-line” filter devoted to that purpose. The author believes there should be a large field for the “Stream-line” filter in the beet sugar industry and that the rate of filtration “would astonish most manufacturers.”—*Nellie E. Fealy.*

2141. HILDRETH, A. C., AND R. B. HARVEY. **Grinding wood samples for analysis.** *Bot. Gaz.* 78: 460-461. *Fig. 1.* 1924.—The adaptation of a rotary pencil sharpener is here described.—*B. W. Wells.*

2142. McALLEP, W. R. **Recent work on clarification in Hawaii.** *Internat. Sugar Jour.* 27: 382-385. 1925.—The author discusses the characteristics of hot clarified juice, H-ion concentration, inversion in alkaline juices, determination of the pH value, importance of regular liming, and desirability of improved filter pressing, and expresses the opinion that Hawaii's lack of progress with filtration problems, the most serious of those confronting Hawaiians in the raw-cane sugar practice, is to a great extent due to failure to realize fully the shortcomings of present equipment in advance of investigations in the last few years.—*Nellie E. Fealy.*

2143. NAKAZAWA, RYÔDI, AND TOKUMATU KOBAYASI. **Gypsum models of a giant colony of yeast fungi.** (Japanese.) *Rept. Dept. Indust., Govt. Res. Inst. Formosa* 5: (1-2). 1 pl. 1924.—The gypsum models of giant colonies of yeast fungi, which in contrast to the formalin-preserved material are naturally much more durable, are described and the photographic details given in the accompanying plate.—*Author (Courtesy Japanese Jour. Bot.).*



2144. PAINE, H. S., M. S. BADOLLET, AND J. C. KEANE. **Effect of certain factors on the candy test of white cane and beet sugars.** *Internat. Sugar Jour.* 27: 263-265. 1925.

2145. PIERCE, ANNE. **Disclosing plant-life secrets.** *Field Illus.* 35<sup>o</sup>: 11-13, 42, 44. 8 fig. 1925.—This is a popular article describing some of the lines of endeavor and the general nature of the equipment at the Boyce-Thompson Institute for Plant Research, located at Yonkers, New York.—*H. O. Werner.*

2146. SMITH, WALTER E. **Measurement of the turbidity of cane juices.** *Internat. Sugar Jour.* 27: 381-382. 1925.—Details are given of the procedure and the results obtained in a study of the various available methods of measuring turbidity, such as the Kopke turbidimeter, and observation of carbon lamp filaments, candle flames, and cross lines on translucent paper through a column of liquid in a cylinder.—*Nellie E. Fealy.*

## TAXONOMY OF VASCULAR PLANTS

J. M. GREENMAN, *Editor*

E. B. PAYSON, *Assistant Editor*

(See in this issue Entries 1431, 1433, 1487, 1494, 1556, 1718, 1742, 1746, 1748, 1749, 1750, 1757, 1760, 1780, 1793, 1794, 1797, 1799, 1801, 1803, 1804, 1805, 1814, 1821, 1858, 1916)

## MISCELLANEOUS, UNCLASSIFIED PUBLICATIONS

SAM F. TRELEASE, *Editor*

2147. ANONYMOUS. **The International Research Council.** *Nature* 116: 138-139. 1925.—This is a report of the third meeting, held at Brussels, July 7-9. Amendments proposed relating to restrictions in membership could not be acted upon on account of the lack of the necessary  $\frac{2}{3}$  membership votes.—*O. A. Stevens.*

2148. ALEXANDER, B. F. **A simple, inexpensive device for maintaining a low degree of temperature.** *Amer. Jour. Public Health* 15: 917. 1 fig. 1925.—This is a brief account of a metal box with a culture compartment and an ice compartment, the whole to be placed in a refrigerator and used for maintaining lower temperatures than are ordinarily secured in a refrigerator.—*C. A. Ludwig.*

2149. HALL, IVAN C., AND HELEN UPTON WING. **The automatic faucet a possible vector of infection.** *Amer. Jour. Public Health* 15: 770-771. 1925.—Attention is called to the possibility of transmitting infection by the use of the type of automatic faucet found in many restaurants in which the lips of the glass are pressed upward against a cross bar. Of a small number of cultures secured from swabs of such cross bars in use, none were characteristic of diluted saliva. The organisms were mainly those characteristic of dust from the air. The authors, however, do not believe that their tests disprove the possibility of the transmission of disease by this means and suggest that another type of automatic faucet be used in which the lips of the glass do not touch any part of the faucet, or that the water be allowed to run continuously during the meal hours.—*C. A. Ludwig.*

2150. LEWIS, C. S. **The Washington meeting of the Society.** *Amer. Fern Jour.* 15: 32-33. 1925.—Report of the Washington meeting of the American Fern Society.—*E. R. Walker.*

2151. McLELLAN, MARY E. **Expedition of the California Academy of Sciences to the Revillagigedo Islands.** *Science* 62: 171-173. 1925.

2152. SCHWARZE, CURT. **Zwei Laboratoriums-Notizen.** [Two laboratory notes.] *Mitteil. Inst. Allg. Bot. Hamburg* 6: 159-165. 3 fig. 1924.—The following are described: (1) An improved form of metal frame for a large moist chamber; (2) a contrivance for the simultaneous washing of 12 different fixed preparations.—*M. Christiansen (translated).*

2153. SEARS, PAUL B. **Botanical criticism.** *Science* 62: 371-372. 1925.

2154. TAMIYA, HIROSHI. **A new device of an automatic microtome for celloidin material.** (Japanese.) *Bot. Mag. Tokyo* 38: (253)-(257). 2 fig. 1924.—For sectioning material im-

bedded in paraffin there are 2 general types of automatic microtomes—the Minot and the Cambridge. These types, however, are not adapted to celloidin material, which is commonly used for human and animal tissues, and sometimes for plant tissues. They are unsuitable for 2 reasons: (1) The direction of the relative movement of the blade to the celloidin object must be oblique to the long axis of the knife, and (2) the surface of the blade and of the material must be repeatedly wetted with alcohol during the operation. It is necessary to repeat complicated and tedious processes with non-automatic types, such as Jung's, Schanze's, etc., when sectioning celloidin material. In the automatic microtome designed by the author for celloidin material, the object to be sectioned is fixed vertically on one end of a horizontal arm, the other end of which is connected to the main axis of the apparatus. This arm repeats a certain portion of a rotary motion by the main axis, that is, it moves like a pendulum in a horizontal plane. At some distance from the axis, but a little shorter than the length of the arm, a knife is held horizontally, the long axis of which must be at a right angle with the middle line of the pendulum movements of the arm, so that the object carried by the arm will be cut by the knife in an oblique direction. The arm makes its pendulum movements by means of a wheel drive, and is gradually fed any desired length before the object touches the blade—the principle being similar to that used in Minot's rotary microtome. A tube from an alcohol tank opens upon the surface of the knife, and a certain quantity of alcohol drops on the knife during sectioning. As the knife is held horizontally, some alcohol always remains on its surface. The sections are carried with a brush from the surface of the knife to alcohol contained in a vessel placed under the knife. As the dropping of alcohol and the feeding of the object are automatically carried out as the sections are cut, the wheel may be turned with one hand and the sections carried from the knife to the vessel with the other hand. The operation is thus much simpler than that with the older methods. With the same principle it is also possible to make an automatic dipping microtome for celloidin objects. In this the main axis is placed horizontally and the arm is dipped vertically into the alcohol, so that each section sinks directly into the alcohol when leaving the knife. The most important points in constructing these microtomes are that the main axis and the arm must be very rigidly made, and that the movements of the arm must be so precisely regulated that feeding is always constant.—*Author (Courtesy Japanese Jour. Bot.).*



